WilTel to air ATM service at T-3 speed

By Bob Wallace
Senior Editor

TULSA, Okla. — WilTel this week will announce a nationwide 45M bit/sec Asynchronous Transfer Mode (ATM) service that will be commercially available in the fourth quarter.

Following the conclusion of field trials with selected users in the third quarter, WilTel will roll out the service, which can be used alone or purchased as part of turnkey offerings supporting specific applications. If the carrier adheres to its plans and rivals stick to theirs, WilTel will be in a neck-and-neck race with Sprint Corp. to deliver ATM service but will beat out AT&T, which will not offer ATM until late next year.

"There's little value to being the first to introduce a new technology," said Bill Wilson, vice president of strategic planning at WilTel. "What counts is rolling out services that users have an immediate need for."

With that in mind, WilTel this week will unveil its first turnkey service, dubbed Channel Networking Service, that will be of- *(continued on page 8)*
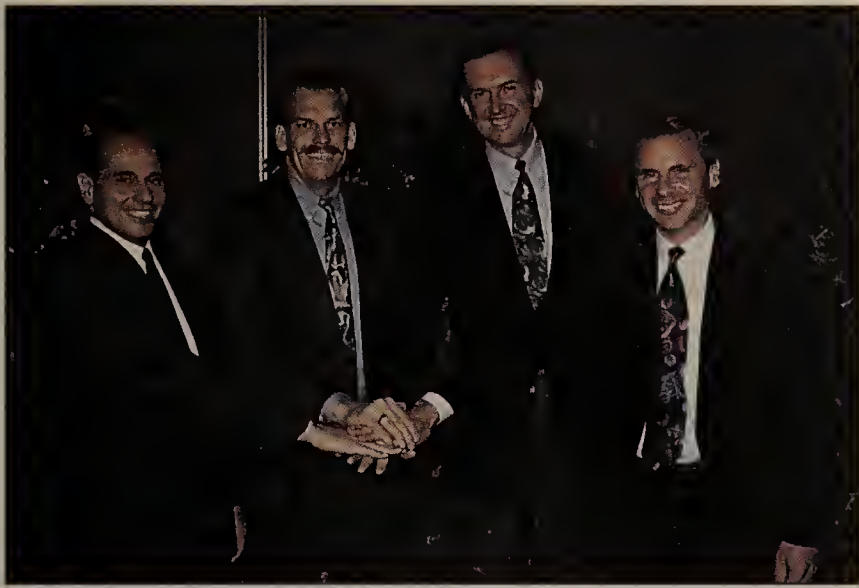
HP's Gary Eichhorn, USL's Roel Pieper, IBM's Bill Filip and SunSoft's Ed Zander (l. to r.) show some team spirit at last week's meeting.

Top rivals unite to build a better Unix, thwart NT

By Fredric Paul
Senior Editor

SAN FRANCISCO — Moved to action by the impending release of Microsoft Corp. Windows NT, six major Unix vendors last week banded together to deliver a "common open software environment" across their respective Unix platforms.

The unlikely partners — Hewlett Packard Co., IBM, Sun Microsystems, Inc., The Santa Cruz Operation, Inc. (SCO), Univel and Unix System Laboratories, Inc. (USL) — said they plan to use bits and pieces of their existing technologies to build a common desktop environment designed to give users a consistent look and feel across different Unix implementations. A new set of application program interfaces (API) will help independent software vendors write to the common desktop.

The companies will also adopt a group of common networking technologies and create a working group to define a common method of system administra- *(continued on page 53)*

Notes drills deeper into the enterprise

Lotus' Landry talks Notes strategy on eve of 3.0 rollout; Windows server version is due to debut.

By Bob Brown
Senior Editor

NEW YORK — Lotus Development Corp. this week will launch Notes 3.0, a feature-rich new version of the work group software that will set the stage for a new generation of applications, according to Lotus' top technologist.

Most of the features in 3.0 have already been discussed by Lotus, but the announcement is expected to include at least one surprise — a Microsoft Corp. Windows server version of Notes.

That would fit neatly with the Notes strategy outlined last week by John Landry, Lotus' senior vice president and chief technology officer. Landry said Lotus is expanding Notes' reach into the enterprise and exploring ways to make Notes accessible to even the smallest work groups.

Landry would not say whether Lotus plans a Windows server version, although a number of sources close to the company confirmed that it will be announced this week. He did say Lotus developers had explored ways of overcoming Window's limitations as a server platform.

Beyond pushing Notes deeper into the corporation, Landry said Lotus is positioning Notes as a *(continued on page 8)*
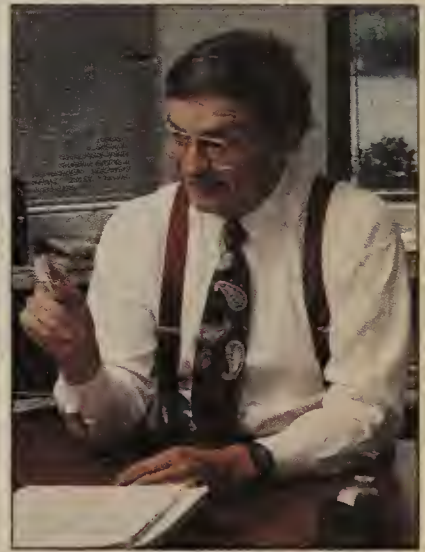
John Landry

DEC sets new course for Pathworks

By Jim Duffy
Senior Editor

LITTLETON, Mass. — Digital Equipment Corp. is extending Pathworks beyond traditional local-area network services to give workstation users greater access to resources across a multivendor enterprise net.

> **DEC Alpha processors to get native NetWare, page 6.**

Pathworks, based on Microsoft Corp.'s LAN Manager, currently offers file and print services, terminal emulation, electronic mail and X Window System server functions. But the product will undergo an 18- to 24-month metamorphosis during which a slew of enterprise networking features will be added, Vijay Tha- *(continued on page 8)*

NETLINE
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IBM TO ENHANCE CPI-C with new directory and improved OSI support. Page 2.

TELEPORT, MFS cry foul to FCC over LEC rates. Page 2.

RBHCS, LONG-HAULERS extend availability of frame relay services. Page 4.

APPLE READIES NEW CROP of servers and software. Page 4.

IBM, SYBASE SET to marry Sybase client/server tools to IBM RS/6000s. Page 6.

UNIFORUM PLAYS HOST to Unix-based rollouts from IBM, Oracle and other vendors. Page 6.

BUYER'S GUIDE gets to the heart of selecting VAN services. Page 35.

NEWSPAPER

100

APPI has run its course; time to rally 'round APPN

By Maureen Molloy
Senior Editor

Once touted as an open alternative to IBM's proprietary APPN model for peer-to-peer SNA networking, APPI now appears to have outlived its usefulness before ever really getting off the ground.

At first, the idea of giving users a choice in how they embrace the so-called New SNA was a welcome one. But given recent developments, most industry observers now say that the rival routing scheme will lead to confusion at best and serious interoperability problems at worst.

Backed by a group of 26 vendors with Cisco Systems, Inc. leading the charge, Advanced Peer-to-Peer Internetworking combines Systems Network Architecture peer networking with Transmission Control Protocol/Internet Protocol features. APPI was designed to address technical deficiencies of IBM's Advanced Peer-to-Peer Networking and provide a standard way to give routers and other net devices APPN-like functionality without incurring an IBM licensing fee.

But much of the APPI Forum's momentum has dissipated since its inception last fall, now that *(continued on page 54)*

NETWORK WORLD'S

R.A.F.
READER ADVOCACY FORCE

IBM piques user interest in CPI-C with new features

Company's plans would make the peer-to-peer application interface suite more open, flexible.

By Michael Cooney
Senior Editor

RALEIGH, N.C. — IBM kept interest in its Common Programming Interface for Communications (CPI-C) simmering last week with the promise of improved directory support, closer ties to OSI nets and improved backward compatibility with older CPI-C applications.

The new features, unveiled at a meeting of the CPI-C Implementors' workshop (CIW) here last week, promise a more open and flexible CPI-C that software developers and users can employ to build more powerful network-

ing applications.

The CIW also confirmed that CPI-C Level 1.2 would be available at the end of the month. CPI-C 1.2 adds key features, such as the ability to support multiple incoming calls from one application to another, as opposed to one session at a time per application as with the current CPI-C Level 1.0 and 1.1.

CPI-C is IBM's high-level application program interface to underlying LU 6.2 data transport protocols. The CIW was formed last fall by IBM and key developers and users — including Eicon

Bypass duo claims LECs try to thwart competition

MFS, Teleport say LECs undercut FCC effort.

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — The country's top two bypass carriers — Teleport Communications Group, Inc. (TCG) and Metropolitan Fiber Systems, Inc. (MFS) — last week accused local exchange carriers of trying to skirt FCC efforts aimed at fostering competition in the local loop.

After a month-long review of about 10,000 pages of information on collocation filed by the carriers with the Federal Communications Commission, TCG said the regional Bell holding companies and GTE Telephone Opera-

tions are proposing rates and conditions that are "unfair and unreasonable."

TCG's accusations are leveled against all of the major local exchange carriers, while MFS' filing is directed at just nine of them.

At the heart of the issue is the FCC's efforts to heighten competition in the local loop by giving local exchange carriers flexibility in setting rates while giving bypass carriers greater access to the same customers by collocating their equipment in local carriers' central offices.

TCG and MFS have asked the

HyperDesk beats rivals to the punch with HD-DOMS

By Wayne Eckerson
Senior Editor

SAN FRANCISCO — Hyper-Desk Corp. last week announced a new version of its HyperDesk Distributed Object Management System (HD-DOMS) and an agreement with Digital Analysis Corp. (DAC) to develop tools to manage HD-DOMS and standards-based objects.

With HD-DOMS scheduled to ship with every copy of Novell, Inc.'s NetWare, the new management tools may well become a predominant means to manage NetWare resources, analysts said.

HD-DOMS is essentially ob-

ject-based middleware that shields programmers from the complexities of building distributed applications in heterogeneous computing environments. Other major vendors, including Hewlett-Packard Co., IBM and Sun Microsystems, Inc., are expected to ship similar products in the next few months.

The new version of HD-DOMS supports additional elements of the Object Management Group's Common Object Request Broker Architecture (CORBA), which specifies how applications access distributed objects.

Briefs

Apple's go-getter. Along with new high-performance servers, Apple Computer, Inc. next week will announce AppleSearch, an information search and retrieval tool that will allow Macintosh users to issue English-language commands to access structured and unstructured text on file servers, no matter what application format it is stored in. The client/server product allows users to perform ad hoc searches or establish "agents" to automatically search a database. Mobile users can trigger a search, hit the road and obtain results when they log on to the net again.

Clinton favors spectrum auction. In a letter to Sen. Daniel Inouye (D-Hawaii), Secretary of Commerce Ron Brown last week said the Clinton Administration would like to see changes in The Emerging Telecommunications Technologies Act of 1993 in which 200 MHz of federally used radio spectrum would be reallocated by the Federal Communications Commission for private-sector use. The senate bill, which would authorize the FCC to conduct spectrum auctioning for 30 MHz on an experimental basis, should be changed "to grant the FCC authority to use competitive bidding on a permanent basis," Brown said. Brown also proposed that if a test of spectrum bidding is undertaken, it should be expanded to at least 150 MHz.

IsoENET passes standards hurdle. IBM and National Semiconductor Corp. announced last week that their joint isochronous Ethernet proposal has been approved by the IEEE 802.9 committee and a draft standard supporting the proposal should be finalized within a year. The IsoENET proposal is designed to support multimedia and interactive videoconferencing applications over local-area networks by layering Integrated Services Digital Network-like circuit-switching capabilities on top of traditional 10M bit/sec Ethernet.

PacBell to waive installation fees. Pacific Bell this week will announce plans to selectively waive installation charges for its Switched Digital Service (SDS 56) and Advanced Digital Network (ADN) digital data services. The carrier will drop the charges for users that sign up for either service and keep it for two years. The ADN offer is for users that convert from analog leased lines and retain all termination points. SDS 56, a switched digital service, carries a onetime $500 installation charge, while ADN comprises point-to-point or multipoint links at speeds of 2,400 to 56K bit/sec and carries a $620 installation charge per termination point.

Novell caters to corporate developers. Novell, Inc. will unveil at its annual BrainShare '93 conference this week its Novell Enterprise Developer Services, a program in which it will offer consulting services to its largest developers. The program will be offered on a fee basis and will provide access to high-end development tools and specialized technical support through a single Novell access point.

BT to align with HP, Sun on CMIP. BT this week will announce that it has entered into an agreement with Hewlett-Packard Co. and Sun Microsystems, Inc. to develop Common Management Information Protocol-compliant interfaces between their respective net management systems. The interfaces, which will be available in early 1994, will allow users of BT's Concert management system to gain an integrated view of a LAN internetwork by retrieving local-area net performance data from HP's OpenView and Sun's SunNet Manager systems.

CONTACTS
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Carriers expand the reach of frame relay services

Two RBHCs, IXCs join the frame relay surge.

By Bob Wallace
Senior Editor

The frame relay fires burned brightly last week as two RBHCs announced their first frame relay services and long-haul carriers, including AT&T and MCI Communications Corp., announced plans to extend availability of the service into Canada and overseas.

Southwestern Bell Corp. and Bell Atlantic Corp. outlined widescale frame relay deployment within their respective regions, while AT&T, MCI and CompuServe, Inc. announced agreements with foreign carriers that will give users more options for extending their frame relay nets internationally.

"Carriers are quickly becoming capable of using frame relay to meet users' complete networking needs," said Laura Capaldini, president of Northpoint Consulting in Reston, Va. "This will help users plan enterprisewide frame relay networks."

Although many regional Bell holding companies offer frame relay in two or three large cities, Southwestern Bell announced immediate availability of the service in 12 cities in its five-state region, while Bell Atlantic said it will offer the service in almost a dozen cities in its territory beginning in June (see graphic, this page).

Southwestern Bell offers frame relay on an intra-local access and transport area basis and charges users a flat monthly fee. It plans to file a tariff for long-haul frame relay links with state regulators next month, according to Tom Prost, Southwestern Bell's frame relay marketing manager.

The RBHC is charging $170 a month for a 56K bit/sec access port, $295 a month for a 384K bit/sec access port and $850 for a 1.536M bit/sec port. The one-time installation charge ranges from $300 to $390. Committed information rates (CIR) supported, which are priced the same as the port speeds, carry no additional charge. Mara Spaulder, manager of broadband/wide-area network product development for Bell Atlantic, last week told *Network World* that her company plans to offer frame relay service to users in five cities and in most of New Jersey.

The service will support 56K bit/sec access ports with CIRs in 8K bit/sec increments up to 32K bit/sec, plus 1.544M bit/sec access ports with CIR in 64K bit/sec increments up to 512K bit/sec. Spaulder would not divulge pricing other than to say it would be based on a flat monthly fee.

Both RBHCs said they plan to interconnect their frame relay services with those offered by interexchange carriers.

On the interexchange front, AT&T last week pledged to soon begin controlled introduction of its frame relay service in Canada and nine European countries, with general availability scheduled for July. In Europe, StrataCom, Inc. switches support port access speeds of 64K and 2.048M bit/sec, as well as 128K and 256K bit/sec where fractional T-1 access is available.

MCI also got into the act by announcing plans to soon roll out a frame relay service to Canada through an agreement with Stentor, an alliance of Canada's nine major telephone companies.

MCI will connect its frame relay service, dubbed HyperStream, with Stentor's in order to give users end-to-end service with uniform features and functions.

Also on the international scene, CompuServe and Rogers Network Services (RNS) announced an agreement to link their respective frame relay nets. CompuServe operates a nationwide net in the U.S. and also serves Toronto, while RNS provides frame relay to Calgary, Alberta; Vancouver; and Montreal. Both carriers use StrataCom IPX fast packet multiplexers.

CompuServe's frame relay service supports access port speeds from 56K to 1.544M bit/sec and permanent virtual circuits (PVC) in 4K bit/sec increments beginning at 4K bit/sec. RNS' frame relay offering supports port access speeds from 56K to 1.024M bit/sec and PVCs in 16K bit/sec increments beginning at 16K bit/sec.

Also north of the border, Unitel Communications, Inc., a Canadian carrier, last week confirmed plans to build a near-nationwide network with Strata-Com switches in order to deliver frame relay service to users in most of the country's provinces early this summer. ∎

Washington Bureau Chief Anita Taff contributed to this article.

Frame relay

Apple boosts performance of software and servers

By Fredric Paul
Senior Editor

CUPERTINO, Calif. — Ending months of speculation, Apple Computer, Inc. this week is expected to announce three high-performance network servers and upgraded versions of its AppleShare networking software.

The Workgroup Servers from Apple's Enterprise Systems Division, combined with the new AppleShare 4.0 and AppleShare Pro file and print service software, have been specially tuned to offer as much as four times the performance of Apple's existing servers while lowering setup and maintenance costs. Also, the top-of-the-line Workgroup Server 95 can be optimized for database applications.

Observers have long chided Apple for lacking a high-performance server. But Pieter Hartsook, editor of The Hartsook Letter, a Macintosh market research service in Alameda, Calif., said the Workgroup Server 95 with AppleShare Pro runs up to three times faster than a high-performance Intel Corp. 486-based server running Novell, Inc. NetWare, and just about as fast as a SPARCstation 10.

"The question is," Hartsook added, "is this too little, too late?" But as it did in the portable market with PowerBook, Apple may be able to make up for lost time.

"It's Apple's unique advantage that they control the operating system and the hardware," Hartsook said. With that combination, the company can create an integrated system tuned for specific applications. Other system integrators "just don't have [that] opportunity," he said.

Designed primarily for file and print service, the entry-level Workgroup Server 60 is equipped with a 20-MHz Motorola, Inc. 68040 processor, built-in Ethernet support, an Apple SuperDrive and 8M bytes of random-access memory (expandable to 68M bytes), System 7.1 software and AppleShare 4.0.

The server roughly doubles the performance of existing AppleShare servers and comes with a choice of 230M- to 500M-byte hard drives and an optional internal CDROM drive. Expected to ship in June, the Model 60 will cost from $3,079 to $4,099, depending on configuration.

The mid-range Workgroup Server 80 is similarly equipped, except that it uses a 33-MHz chip, a 500M-byte or 1G-byte hard drive, and holds as many as 136M bytes of RAM. The Model 80 is designed for file, print and communications service, with about three times the performance of existing servers. Models 60 and 80 support as many as 150 users each. Also shipping in June, the Model 80 will cost between $6,399 to $9,959.

The high-end Workgroup Server 95 is based on an Apple Quadra 950 with hardware acceleration tricks. It uses the same processor as the Model 80 but comes with 16M bytes of RAM (expandable to 256M bytes) and a wide choice of hard drives.

The Model 95 uses AppleShare Pro and a new server version of A/UX 3.0.1, Apple's version of Unix, tuned to support file and print services or database services. That adds asynchronous I/O, A/UX system caching, and support for as many as 5,000 open files and 20 Small Computer System Interface devices. The Model 95 more than quadruples the file and print performance of Apple's fastest existing servers, supporting up to 200 concurrent users.

Apple is working with Oracle Corp., based in Redwood City, Calif., and other providers to deliver database products for the Model 95. Apple claimed that Oracle will soon release a version of Oracle7 tuned for A/UX 3.0.1.

> ❝ **I**t's Apple's unique advantage that they control the [OS] and the hardware."
>
> ▲▲▲

Jim Groff, a senior director for Apple's Enterprise Systems Division, said the database version of the Model 95 is a full-blown cross-platform product, supporting Macintosh, Windows, Unix and OS/2 clients.

The Workgroup Server 95 is expected to ship in April. Prices will range from $7,589 for a base model and $11,319 for a unit tuned for database environments, up to $20,000 to $25,000 for a fully loaded model.

AppleShare Pro will ship in April for $2,399. AppleShare 4.0 — which also runs on the Macintosh Centris 610 and the Macintosh Quadra 700, 800, and 950 — will ship this summer for $1,899. AppleShare 3.0 will continue to be available for $1,199. ∎

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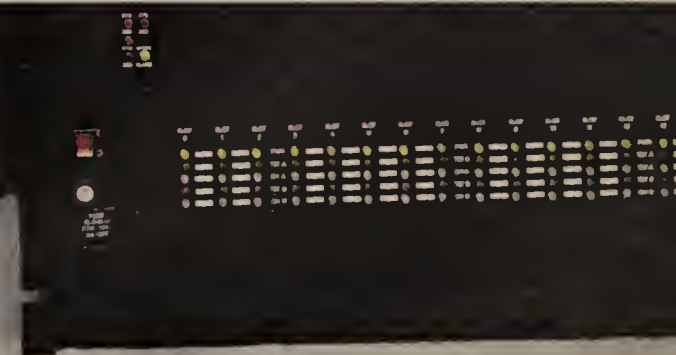
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Circle Reader Service #6

IBM, Oracle lead software firms in UniForum debuts

By Wayne Eckerson
Senior Editor

SAN FRANCISCO — A number of leading software vendors used UniForum 1993 here to announce significant new additions to their product lines as well as upgrades to existing software.

The pack was led by IBM, which, as expected, beefed up its Information Warehouse data framework by unveiling a Unix database for the IBM RISC System/6000 processor and announcing a multisite update capability for DB2 on IBM MVS mainframes ("IBM revving up database portfolio," NW, March 15).

The new DB2 AIX/6000 database supports direct connectivity to IBM host databases, on-line transaction processing applications via IBM's AIX CICS/6000 transaction manager and Microsoft Corp.'s Open Database Connectivity (ODBC) standard for connecting to SQL databases.

IBM also announced a new query tool for RS/6000 workstations and OS/2 client versions of IBM Application System and Personal Application System decision support systems. IBM said it will jointly market decision support systems and executive information system products from The Intelligent Office Co., Ltd. and Comshare, Inc., respectively.

Also at UniForum, Oracle Corp. introduced its Cooperative Development Environment, an integrated set of a dozen new and existing Oracle application development tools ("DBMS rivals take aim at client/server," NW, March 1). The tools span every step of the application development life cycle and include computer-aided software engineering software, data access tools, form and report writers, and fourth-generation languages.

The applications can be deployed across multiple graphical user interfaces — including Microsoft Windows, OS/2, Motif and Macintosh — without modification or additional programming. The Cooperative Development Environment applications also support multimedia data types and can access data on a variety of databases via proprietary gateways or Microsoft's ODBC.

In other announcements, Information Builders, Inc. said it will integrate its EDA/SQL servers with Group Bull SA's Distributed Data Access products that run on Bull's DPX/20 Unix servers. Distributed Data Access lets DOS, Windows and Unix desktop users connected to the DPX/200 access 16 databases. The interface to EDA/SQL would give access to another 50 databases.

Information Builders also said it is integrating its Focus fourth-generation language with Unix System Laboratories, Inc.'s Tuxedo transaction processing system. Available in the fourth quarter, Focus for Tuxedo will work with Unix System Laboratories' System/T transaction monitor and Unix databases from Oracle, Sybase, Inc., Informix Software, Inc. and Ingres, an ASK company, among others. The product will make it easier for developers to write on-line transaction processing applications that can concurrently access multiple networked databases, Information Builders officials said.

Computer Associates International, Inc. (CA) announced it will incorporate Cheyenne Software, Inc.'s local-area network storage technology into CA-Unicenter, CA's systems management product for Unix computing environments. Cheyenne is a leading maker of device driver technology for tape and optical drives. Cheyenne's technology will form an integral part of CA-Unicenter's network backup and archiving systems.

NCR Corp. unveiled several enhancements to its Top End Unix-based on-line transaction processing system. The new features include suppport for IBM 3270 terminals, Microsoft Windows Dynamic Link Libraries and international character sets. ☒

Novell, DEC to Alpha-betize NetWare

By Caryn Gillooly
Senior Editor

MAYNARD, Mass. — Novell, Inc. last week put another notch in its RISC belt, announcing an agreement to provide native NetWare for machines based on Digital Equipment Corp.'s Alpha AXP microprocessors.

Under terms of the agreement, the two companies will work together to develop, market and support NetWare on Alpha-based servers and clients. In addition, DEC will sell its Alpha-based machines preloaded with NetWare at customers' request.

For DEC, the agreement could help popularize its Alpha machines. "NetWare running natively on Alpha hardware will broaden the market appeal of Digital's new system," said Janet Hyland, director of Network Strategy Services at Forrester Research, Inc., a research and consulting firm based in Cambridge, Mass.

DEC is not relying on Novell alone. The company also has an agreement with personal computer software powerhouse Microsoft Corp. to port Microsoft's Windows NT operating system to Alpha. Although NT may not ship until the summer, it will be available before the NetWare-on-Alpha product, expected to ship sometime next year.

For Novell, the DEC partnership builds on similar deals Novell has made with Sun Microsystems, Inc. to offer native NetWare on Sun's scalable processor architecture-based machines and with Hewlett-Packard Co. to provide NetWare on HP's Precision Architecture-Reduced Instruction Set Computing (PA-RISC) platform. "There's really no difference between any of these [deals]," said Frank Dzubeck, president of Washington, D.C.-based Communications Network Architects, Inc.

NetWare support will be limited to NetWare 4.0, unveiled at the recent INTEROP 93 Spring trade show. A software developers' kit for building NetWare 4.0 applications on Alpha platforms will be available by year end. An Alpha-optimized version of NetWare and versions for the other RISC platforms are expected to be available next year.

Sybase tools to get closer fit with RISC System/6000

By Wayne Eckerson
Senior Editor

SAN FRANCISCO — Sybase, Inc. and IBM last week detailed a strategic partnership to more closely intertwine Sybase client/server tools and databases with IBM's RS/6000 Unix workstations and servers.

Unveiled at UniForum 1993 here, the partnership calls for IBM and Sybase to work together in selling and optimizing new and existing Sybase products for the RISC System/6000. The agreement encompasses all of Sybase's product line, including its SQL Server database, client/server application development tools and its upcoming suite of System 10 database servers and gateways.

Ironically, IBM last week unveiled its new AIX database, called Database 2 AIX/6000, which will compete directly with Sybase's SQL Server database on IBM RS/6000 platforms (see "IBM, Oracle lead software firms in UniForum debuts," this page).

Sybase has similar arrangements with Digital Equipment Corp., Hewlett-Packard Co., NCR Corp. and Sun Microsystems, Inc.

"We will have one point of contact to resolve problems that may arise between IBM and Sybase products," said M.R. Rangaswami, vice president of marketing for Avalon Software, speaking at the joint press conference here.

Avalon, a maker of client/server manufacturing software, runs its business on Sybase SQL Server databases and IBM RS/6000 servers, and uses Sybase development tools running on RS/6000 workstations.

IBM and Sybase plan to work together to optimize Sybase System 10 database products to achieve a throughput of 1,000 transactions per second on the RS/6000s. Products that attain these throughput levels will be available in 1994, officials said.

IBM will supply Sybase with early versions of new and upgraded RS/6000s, so Sybase software will be concurrently available with all new hardware releases. Conversely, the agreement will allow Sybase to make new releases of its software immediately available for the RS/6000. ☒

Bypass duo makes claims

FCC to at least suspend and investigate collocation tariff filings already made with the agency.

"LECs want the increased flexibility that the FCC has promised, but they're doing everything they can to forestall competition," said Robert Atkinson, senior vice-president of regulatory and external affairs for TCG. "If they're successful at doing this, it's users who will lose."

> " If [LECs are] successful at doing this, it's users who will lose."
>
> ▲▲▲

MFS echoed TCG's sentiments. "The LECs evidence bad faith by proposing tariffs containing grossly inflated rates and patently unreasonable terms and conditions," MFS stated. "Through such actions, the LECs undoubtedly hope to circumvent the commission's collocation order, either by setting their collocation charges so high that no customer would take advantage of them or by forcing the commission to conduct an investigation, during which the LECs could continue to exploit their dominant position in the local exchange market."

In its filing, TCG gave several examples to support its claims:

■ Bell Atlantic Corp. seeks to charge almost $70 for a T-1 cross-connection between its net and a bypass carrier's net, while Ameritech wants $14 and US West, Inc. would like $27. TCG now pays $3.51 to New York Telephone Co. for each T-1 cross-connection.

■ GTE wants $10,000 to take a T-1 interconnection order, with US West and BellSouth Corp. wanting $7,000 and $6,000, respectively, while other carriers would like to charge nothing.

■ Most of the local exchange carriers want between $50,000 and $100,000 to install the facilities needed to support bypass carriers' equipment, but they provide no justification for the charges.

The RBHCs maintain that the prices proposed are fair. "Our prices are cost-based," said Dan Hubbard, vice-president of regulatory affairs for Southwestern Bell Corp.

TCG said the local exchange carriers have also proposed numerous terms and conditions to hamper the operations of TCG and other bypass carriers and to increase costs.

For example, TCG said all the local exchange carriers have proposed expensive planned and surprise inspections of collocation operations. Local exchange carriers also demand that TCG and other bypass carriers' employees be shadowed by expensive "escorts," with the charges passed onto TCG and other bypass carriers. The bypass carrier said there are no such conditions in existing collocation arrangements.

However, Hubbard said the charges are necessary and the inspections and escorts are part of the central office interconnection process. "We're concerned about the security of central offices once [outside parties] establish operations in them."

The FCC declined comment on the bypass carriers' filings pending further study. ☒

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Lotus' Notes drills deeper

continued from page 1

means of network-enabling desktop applications and, in the long term, changing the way companies build and use applications.

"We're opening the door to a new class of revolutionary, strategic applications," he said.

What's new

New features for Notes 3.0 include support for new client and server platforms, including Apple Computer, Inc. Macintosh and Novell, Inc. NetWare. Notes 3.0 will also boast support for Novell's Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX), X.25 and other protocols, and work flow features based on technology from Action Technologies, Inc.

According to Landry, Lotus initially positioned Notes for high-end users, basing it on IBM OS/2 servers and OS/2 and Windows clients.

But Lotus has designed Notes 3.0 to address needs further down "the user pyramid," including companies with large installed bases of Unix, NetWare and Macintoshes.

One of the most eagerly anticipated Notes 3.0 features is support for Unix, which Lotus demonstrated for the first time last week at UniForum 1993 in San Francisco.

By the second half of this year, Lotus will ship client and server versions of Notes for Sun Microsystems, Inc.'s SPARCstations running Solaris, Hewlett-Packard Co.'s 9000 Series 700 and 800 systems under HP-UX, IBM's RISC System/6000s running AIX, and personal computers under The Santa Cruz Operation, Inc.'s SCO Unix.

Sarah Heany, engineering applications project leader at Cabletron Systems, Inc., a Rochester, N.H., Notes 3.0 beta user, said Unix support will enable her company to expand the use of Notes within its engineering corps, which predominantly uses Unix workstations. Cabletron is running about 40 Notes applications, but Notes use has been limited somewhat to managers and project leaders who have PCs.

Jeff Held, a partner at Ernst & Young, a Vienna, Va., consulting firm, applauded the Notes extensions. "Now Notes is suitable as an enterprise application," he said. "Lotus is changing the way people can use Notes by building into it better networking, system management and cross-platform support."

Landry said support for users at the bottom of the user pyramid — small companies and remote offices — may be on the way, as well. Lotus is exploring the possibility of developing peer capabilities for Notes so, for example, Windows workstations could act as both clients and servers locally while being tied across an enterprise net into other server-based Notes systems.

Lotus also is looking to work with information service providers to develop what would essentially be public Notes servers, according to Landry. For example, users with only a few offices could use Notes locally and share access to a public Notes server.

Notes 3.0's support for X.25 is a key underpinning to such a plan, but Landry said work still needs to be done in other areas such as billing for Notes server usage before such an offering will become a reality.

Landry declined to comment when asked if Lotus was working with specific information service providers, although he said CompuServe, Inc. was a Notes user and "shared our vision."

New applications

Efforts to put Notes into the hands of more users are ultimately designed to position the software as the platform for a new class of shared applications, Landry said. "We're talking about truly shifting the thinking about what applications will be and how to build them," he said.

As Landry sees the evolution of Notes, there will be an application-centric phase in which end users will work with a typical desktop application but will have transparent access to Notes services. For example, a user could see Lotus 1-2-3 at the desktop but could have the ability to store information on a Notes server so other 1-2-3 users could share it.

Lotus is Notes-enabling its applications and plans to showcase Notes-readiness in the next version of 1-2-3 here this week, Landry said. Lotus is making a Notes Open Application Program Interface available to any developer and plans to formalize that effort soon, he added.

Over time, Lotus will support a more Notes-centric applications environment in which end users employ the Notes interface to access Notes services and, transparently, the functions of traditional desktop applications such as spreadsheets. Using the Object Linking and Embedding technology, Lotus will provide links between Notes and these applications so that a presentation capability, for example, will automatically be kicked off when needed without the user logging on to a separate application.

The Notes-centric environment will set the stage for application developers to unbundle their products so that pieces of them can be incorporated directly into Notes. ◪

WilTel to air ATM service

continued from page 1

fered this month over its T-3 net and later over ATM. Wilson said WilTel has reached agreements with two channel extension product vendors — Network Systems Corp. and Computer Network Technology Corp. — to package their devices with its ATM service. Also, the three will team up to offer installation and maintenance.

WilTel also plans to offer turnkey video and multimedia services, to be launched in the first half of 1994. "We've been approached by companies that want to package their video products with our services," Wilson said.

Analysts said carriers face an uphill battle selling ATM, but they like WilTel's approach of selling service and equipment for specific applications.

"Users say they don't have a good feel for applications that need ATM, so the carriers need to show them where and when ATM is a better buy and more efficient than the high-speed private-line services they use today," said Tom Nolle, president of CIMI Corp., a Voorhees,

Bill Wilson

N.J., consultancy specializing in advanced carrier services. "Without set pricing, that's going to be tough."

WilTel, like AT&T, will sell ATM via customer-specific contracts, not as a general tariff. WilTel said it is working on price comparisons that show how 45M bit/sec ATM stacks up against WilTel's existing T-3 private lines but declined to provide them.

WilTel's ATM services will be offered from NEC America, Inc. NEAX 61E cell relay switches in eight U.S. locations, which WilTel would not name. The switch supports 48 T-3s and has a maximum throughput of 2.4G bit/sec. As it does with its WilPak frame relay service, WilTel will backhaul customers to the nearest NEC switch until there is adequate demand.

"We're not going to put a switch in every major U.S. city until users say they'll buy service there," Wilson said. He added the carrier will gradually migrate to a net comprising only ATM switches but emphasized that is unlikely to happen for several years.

The carrier stressed its commitment to ATM technology and said it will offer ATM at speeds above T-3. However, like AT&T, WilTel would not say when the offerings will be available. ◪

Carriers vie for ATM lead

Carrier	Availability	Switch	Speed	Trials/Introduction	Pricing
WilTel	4Q 93	NEC America, Inc. NEAX 61E	45M bit/sec	Trial completed, no controlled introduction	Customer-specific
AT&T	4Q 94	AT&T Network Systems' GCNS-2000 and StrataCom, Inc. switches	45M bit/sec	Controlled introduction in 1st half 1994	Customer-specific
Sprint Corp.	4Q 93	TRW, Inc.'s Broadband Access Switch 2010	45M bit/sec	No trials or controlled introduction	Customer-specific
MCI Communications Corp.	Not yet announced	Can upgrade its Siemens Stromberg-Carlson switches to support ATM	NA	NA	NA

SOURCE: NETWORK WORLD

DEC sets new Pathworks course

continued from page 1

kur, DEC's Network Operating Systems business manager, said in a strategy briefing last week.

Those features include new multivendor systems and asset management tools, automated backup of data from multivendor environments, and support for the Open Software Foundation, Inc.'s Distributed Computing Environment. DEC will also offer so-called navigation tools that help users access network resources and application program interfaces (API) to ease development of mobile computing and multimedia applications.

Some services, like systems and asset management, will appear with Pathworks 5.0 later this year ("DEC plans a Pathworks make-over," NW, Jan. 4).

In the management realm, future versions of Pathworks client and server software will include Simple Network Management Protocol agents.

DEC will also offer director code that will enable a Windows or Macintosh client to retrieve configuration data on Pathworks clients and servers, Thakur said. The administrator could then schedule software updates and file backups.

DCE support will provide Pathworks with remote procedure call (RPC) technology, a key component in building distributed applications. RPC technology will also help DEC deliver a directory service for Pathworks environments, an area DEC still needs to address, said Katrina Holman, DEC group manager for personal computer integration marketing.

APIs for mobile computing will let mobile users access Pathworks servers and services as if they were attached locally, she said. New multimedia capabilities will allow Pathworks to support the voice, video and image traffic inherent in multimedia applications.

Pathworks licensing may be in for a bit of change as well. The product is currently available under a client license arrangement, but DEC will break with tradition and offer versions of Pathworks on a concurrent use license basis.

Concurrent use licensing will allow users to buy Pathworks on a per-server basis — for example, a 25-, 50- or 100-user license. Under the client pricing scheme that has been in place since Pathworks was introduced in the late 1980s, users purchase a Pathworks license for each client workstation, which can then access an unlimit-

ed number of servers.

The concurrent use license is designed for customers that may not find the per-client fee cost-effective, Thakur said. That could include users with large NetWare nets and a couple of VAX servers.

"Where customers have native NetWare networks with a large number of clients but only a few of them need to get access to a few VMS servers, [client licensing] probably would not work," Thakur said.

DEC will introduce the concurrent use licensing program when the NetWare version of Pathworks for OpenVMS — called Pathworks for OpenVMS (NetWare) — ships later this spring.

DEC is looking to make concurrent use licensing available across the Pathworks product line, Thakur said, though client-based licensing is still the company's preferred method for selling the network operating system. ◪

Correction: Thomas Hatch was incorrectly identified in last week's issue as president of Chipcom Corp. Hatch was vice president of manufacturing for the company before resigning. Rob Held is Chipcom's president and chief executive officer.

8 NETWORK WORLD • MARCH 22, 1993

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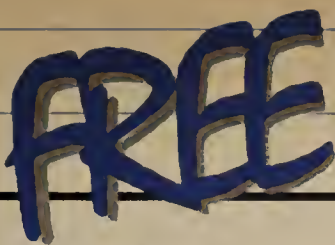
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Please Answer ALL Questions, Sign and Date the Form.

---

1 Industry: (check one only)

- 01. ☐ Manufacturers (other than Computer/Communications)
- 02. ☐ Finance/Banking
- 03. ☐ Insurance
- 04. ☐ Real Estate
- 05. ☐ Healthcare Services
- 06. ☐ Legal
- 07. ☐ Hospitality
- 08. ☐ Retail/Wholesale Trade/Business Services
- 09. ☐ Transportation
- 10. ☐ Utilities
- 11. ☐ Education
- 12. ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
- 13. ☐ Government, State/Local
- 14. ☐ Government, Federal
- 15. ☐ Military
- 16. ☐ Aerospace
- 17. ☐ Consultants (Independent)
- 18. ☐ Carriers
- 19. ☐ Interconnects
- 20. ☐ Manufacturers (Computer/Communications)
- 21. ☐ VAR/VAD/VAN/ Systems Houses
- 22. ☐ Distributors, Computer Related
- 23. ☐ Distributors, Communications Related
- 24. ☐ Other_____

2 What is your job function? (check one only)

NETWORKING MANAGEMENT
- 1. ☐ Networking Mgmt.
- 2. ☐ LAN Mgmt.
- 3. ☐ Datacom/Telecom Mgmt.
- 4. ☐ Engineering Mgmt.

MIS MANAGEMENT
- 5. ☐ MIS, IS, IT Mgmt.
- 6. ☐ Engineering Mgmt.

CORPORATE MANAGEMENT
- 7. ☐ Corporate Mgmt. (CIO, CEO, Pres., VP, Dir., Mgr., Financial Mgmt.)
- 8. ☐ Consultant (Independent)
- 9. ☐ Other_____

3 My responsibilities include: (check one only)

- 1. ☐ LANs/ Internetworking/ WANs
- 2. ☐ LANs/ Internetworking
- 3. ☐ LANs
- 4. ☐ WANs
- 5. ☐ None

4 What is the total number of sites for which you have purchase influence? (check one only)

- 1. ☐ 100+
- 2. ☐ 50 - 99
- 3. ☐ 20 - 49
- 4. ☐ 10 - 19
- 5. ☐ 2 - 9.
- 6. ☐ 1
- 7. ☐ None

5 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. Scope (check one only)
- 1. ☐ Corporatewide
- 2. ☐ Multienterprise (consultants)
- 3. ☐ Departmental

B. Involvement (check all that apply)
- 1. ☐ Recommend/Specify
- 2. ☐ Approve
- 3. ☐ Evaluate
- 4. ☐ None (A or B)

6 Check all that apply in Columns A and B:

A. I am involved in the purchase of the following products/services.
B. I plan to purchase the following products/services in the next year.

Involved A	Plan to Purchase B	
		LOCAL-AREA NETWORKS
☐ 01.	☐	Local-Area Networks
☐ 02.	☐	LAN Servers
☐ 03.	☐	LAN Operating Systems Software
☐ 04.	☐	Superservers
☐ 05.	☐	Data Base Servers (Oracle, Sybase, etc).
☐ 06.	☐	Terminal Servers
☐ 07.	☐	LAN Services
☐ 08.	☐	LAN Storage Devices (optical, tape, disk, etc,. including backup systems)
☐ 09.	☐	Network Test Equipment
☐ 10.	☐	Hubs
☐ 11.	☐	Cables, Connectors, Baluns
☐ 12.	☐	UPS
☐ 13.	☐	Network Adapter Boards
☐ 14.	☐	Peer-to-Peer LANs
☐ 15.	☐	Wireless LANs
☐ 16.	☐	SNMP Network Management
☐ 17.	☐	ATM (Asynchronous Transfer Mode)
A	**B**	**INTERNETWORKING**
☐ 18.	☐	Bridges
☐ 19.	☐	Routers
☐ 20.	☐	Gateways
☐ 21.	☐	Bridge/Routers
☐ 22.	☐	Hubs
☐ 23.	☐	Intelligent Hubs
☐ 24.	☐	Communications Servers

Involved A	Plan to Purchase B	
		COMPUTERS/PERIPHERALS
☐ 25.	☐	Micros/PCs
☐ 26.	☐	Minis
☐ 27.	☐	Mainframes
☐ 28.	☐	Pen-Based
☐ 29.	☐	Laptops
☐ 30.	☐	Workstations
☐ 31.	☐	Image Processing Workstations
☐ 32.	☐	Front-End Processors
☐ 33.	☐	Terminals
☐ 34.	☐	Printers
☐ 35.	☐	Cluster Controllers
☐ 36.	☐	Fax Machines
☐ 37.	☐	X-Terminals
A	**B**	**SOFTWARE/APPLICATIONS**
☐ 38.	☐	Network Management
☐ 39.	☐	Micro to Mainframe
☐ 40.	☐	Security
☐ 41.	☐	Communication/Terminal Emulation
☐ 42.	☐	Word Processing
☐ 43.	☐	Operating Systems
☐ 44.	☐	Business Applications (Finance/Mfg/HR)
☐ 45.	☐	Applications Development
☐ 46.	☐	Data Base Management
☐ 47.	☐	Spreadsheet
☐ 48.	☐	Groupware
☐ 49.	☐	EDI
☐ 50.	☐	E-Mail
☐ 51.	☐	Windows/Graphical User Interface
☐ 52.	☐	4GL/Development
☐ 53.	☐	Multimedia
☐ 54.	☐	Graphics
☐ 55.	☐	Utilities
A	**B**	**WIDE-AREA NETWORK EQUIPMENT/SERVICES**
☐ 56.	☐	Modems (9.6K bps and over)
☐ 57.	☐	Modems (under 9.6K bps)
☐ 58.	☐	T-1
☐ 59.	☐	T-3
☐ 60.	☐	Fractional T-1
☐ 61.	☐	Data Switches
☐ 62.	☐	SMDS
☐ 63.	☐	ATM (Asynchronous Transfer Mode)
☐ 64.	☐	Matrix Switches
☐ 65.	☐	Packet Switches
☐ 66.	☐	Protocol Converters
☐ 67.	☐	Diagnostic/Test Equipment
☐ 68.	☐	DSU/CSUs
☐ 69.	☐	Microwave
☐ 70.	☐	Fax Boards/Modems
☐ 71.	☐	VSAT
☐ 72.	☐	Fiber Optic
☐ 73.	☐	Satellite
☐ 74.	☐	ISDN
☐ 75.	☐	PBXs (over 1000 lines)
☐ 76.	☐	PBXs (under 1000 lines)
☐ 77.	☐	Automatic Call Distributors
☐ 78.	☐	Voice Messaging Systems
☐ 79.	☐	Videoconferencing Systems
☐ 80.	☐	Voice Response/Processing
☐ 81.	☐	Switched Voice
☐ 82.	☐	Dedicated Leased Line
☐ 83.	☐	Switched Data
☐ 84.	☐	Centrex
☐ 85.	☐	E-Mail/On-Line Information
☐ 86.	☐	Image Processing
☐ 87.	☐	Audio Teleconferencing
☐ 88.	☐	Local Services
☐ 89.	☐	WATS MTs
☐ 90.	☐	International
☐ 91.	☐	Virtual Networks
☐ 92.	☐	Frame Relay
☐ 93.	☐	Value Added Services
☐ XX.	☐	None of the above (1-93)

7 What is the total number of A: LANs B: Workstations/Nodes in your entire organization?

	LANs A	Workstations/Nodes B
1.	☐ 5,000+	☐
2.	☐ 1,000 - 4,999	☐
3.	☐ 100 - 999	☐
4.	☐ 50 - 99	☐
5.	☐ 10 - 49	☐
6.	☐ 9 or Less	☐

8 Which of the following network platforms are currently installed/planned in the next year?

NETWORK ARCHITECTURES

Present	Planned	
☐ 01.	☐	SNA
☐ 02.	☐	DECNET
☐ 03.	☐	MAP/TOP
☐ 04.	☐	TCP/IP
☐ 05.	☐	DCA (Unisys)
☐ 06.	☐	X.25

Present	Planned	
☐ 07.	☐	NOVELL IPX/SPX
☐ 08.	☐	APPC/APPN/LU 6.2
☐ 09.	☐	NETBIOS
☐ 10.	☐	OSI
☐ 11.	☐	APPLETALK
☐ 12.	☐	OTHER_____

LAN OPERATING SYSTEM

Present	Planned	
☐ 13.	☐	LOCALTALK (APPLETALK)
☐ 14.	☐	BANYAN (VINES)
☐ 15.	☐	DCA (IRMALAN)
☐ 16.	☐	DCA (10-NET)
☐ 17.	☐	IBM (LAN SERVER)
☐ 18.	☐	IBM (PC LAN PROGRAM)
☐ 19.	☐	MICROSOFT (LAN MANAGER)
☐ 20.	☐	UNGERMANN-BASS (NET/1)
☐ 21.	☐	NOVELL (NETWARE, 2.X, 3.X, 4.X)
☐ 22.	☐	PROTEON (PRONET)
☐ 23.	☐	SITKA (TOPS)
☐ 24.	☐	3COM (3+, 3+OPEN)
☐ 25.	☐	ARTISOFT (LANTASTIC)
☐ 26.	☐	HAYES (LANSTEP)
☐ 27.	☐	DEC (PATHWORKS)
☐ 28.	☐	OTHER_____

LAN ENVIRONMENT

Present	Planned	
☐ 29.	☐	4M TOKEN RING
☐ 30.	☐	16M TOKEN RING
☐ 31.	☐	ARCNET
☐ 32.	☐	ETHERNET
☐ 33.	☐	STARLAN
☐ 34.	☐	FDDI
☐ 35.	☐	LOCALTALK
☐ 36.	☐	10BASE-T
☐ 37.	☐	OTHER_____

OPERATING SYSTEM

Present	Planned	
☐ 38.	☐	DOS
☐ 39.	☐	UNIX/XENIX/AIX
☐ 40.	☐	OS/2
☐ 41.	☐	OS/2 2.X
☐ 42.	☐	MVS
☐ 43.	☐	VM
☐ 44.	☐	VMS
☐ 45.	☐	MACINTOSH
☐ 46.	☐	WINDOWS
N/A 47.	☐	WINDOWS NT
☐ 48.	☐	X WINDOWS
☐ 49.	☐	OTHER_____

9 For which areas outside of the U.S. do you have purchase influence? (check all that apply)

- 1. ☐ Europe
- 2. ☐ Asia
- 3. ☐ South America
- 4. ☐ Australia
- 5. ☐ Middle East
- 6. ☐ None

10 Which of the following hardware platforms is installed/planned in your company? (check all that apply)

	Mainframes Currently Installed	Planned Next Year	Minis Currently Installed	Planned Next Year
01. DEC	☐	☐	☐	☐
02. IBM	☐	☐	☐	☐
03. AMDAHL	☐	☐	☐	☐
04. AT&T	☐	☐	☐	☐
05. BULL HNIS	☐	☐	☐	☐
06. DATA GENERAL	☐	☐	☐	☐
07. HP	☐	☐	☐	☐
08. TANDEM	☐	☐	☐	☐
09. UNISYS	☐	☐	☐	☐
10. OTHER_____	☐	☐	☐	☐

MICROCOMPUTERS (fill in the numbers)

	NUMBER INSTALLED	NUMBER PLANNED NEXT YEAR
11. MACINTOSH 20, 30, 40		
12. MACINTOSH OTHER		
13. PCs BASED ON 80586	N/A	
14. PCs BASED ON 80486		
15. PCs BASED ON 80386		
16. PCs BASED ON 80286		
17. PCs BASED ON 8086/8088		
18. RISC / UNIX BASED WKSTNS		
19. OTHER		

11 Estimated value of networking equipment and services:

A. Which you helped specify, recommended or approved in the last year?
B. Which you plan to help specify, recommend or approve in the next year?

A	B	
☐ 1.	☐	$100 million and over
☐ 2.	☐	$50 - $99.9 million
☐ 3.	☐	$25 - $49.9 million
☐ 4.	☐	$20 - $24.9 million
☐ 5.	☐	$10 - $19.9 million
☐ 6.	☐	$5 - $9.9 million
☐ 7.	☐	$1 - $4.9 million
☐ 8.	☐	$500,000 - $999,999
☐ 9.	☐	$499,999 or less

12 Estimated gross annual revenue of your entire company/institution: (check one only)

- 1. ☐ Over $10 billion
- 2. ☐ $1 to $9.9 billion
- 3. ☐ $500 to $999.9 million
- 4. ☐ $100 to $499.9 million
- 5. ☐ $50 to $99.9 million
- 6. ☐ $10 to $49.9 million
- 7. ☐ $5 to $9.9 million
- 8. ☐ $4.9 million or less

13 Estimated number of employees for your entire corporation:

- 1. ☐ Over 10,000
- 2. ☐ 5,000 - 9,999
- 3. ☐ 2,500 - 4,999
- 4. ☐ 1,000 - 2,499
- 5. ☐ 500 - 999
- 6. ☐ 499 or less

9226

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The shrinking cost of shrink-wrapped Unix

Costs for running UnixWare on a 5-node network with an application server and support for Windows applications.

Before price cuts:	
UnixWare Personal Edition, 5 copies at $495	$2,475
MS Merge software (adds Windows support), 5 copies at $395	$1,975
UnixWare Application Server	$2,495
Subtotal	**$6,945**
Software Development Kit	$995
Total	**$7,940**

After price cuts, Windows support:	
UnixWare Personal Edition, 5 copies at $249	$1,245
UnixWare Application Server	$1,299
Subtotal	**$2,544**
Software Development Kit	$599
Total	**$3,143**

SOURCE: UNIVEL, SAN JOSE, CALIF.

Netnotes

Sun Microsystems Computer Corp. (SMCC) last week announced that it has acquired 10% of ELVIS+, Ltd., a private Russian corporation with expertise in wireless networking and satellite communications. SMCC and ELVIS+ also signed a technology licensing and joint development deal. Neither company would disclose the value of the deal.

SMCC said it hopes to eventually include ELVIS+ technology in the infrastructure, which is designed to support what it calls "nomadic" computing. Much of the development will center on software protocols needed for this kind of enterprise. Initial products will focus on local-area networking uses, but future developments may include both terrestrial and space-based systems, said Curt Wozniak, vice president of engineering for SMCC.

ELVIS+, based outside of Moscow, has extensive experience in radio technology and special expertise in integrating software and hardware into easy-to-use packages as well as in miniature antennas.

Under the nonexclusive agreement, ELVIS+, a Russian acronym for Electronic Computer and Information Systems, will use SMCC SPARCstations as a development platform.

SMCC, based in Mountain View, Calif., will pay royalties to use any products from ELVIS+. ∎

UnixWare prices chopped; Windows support added

Cuts up to 50% help move gear into mainstream.

By Caryn Gillooly
Senior Editor

SAN JOSE, Calif. — Although UnixWare has only been shipping since December, Univel last week cut prices on the desktop and application server versions of its relatively new operating system.

The company also enhanced its UnixWare Personal Edition, enabling it to run Microsoft Corp. Windows applications. The original desktop edition could only run Unix and DOS applications.

UnixWare is a shrink-wrapped version of Unix that runs on Intel Corp.-based machines. It was developed by Univel, a joint venture between Novell, Inc. and Unix System Laboratories, Inc., which is owned by Novell.

Prices on the UnixWare Personal Edition for desktop use were reduced 50%, from $495 to $249, while prices for the UnixWare Application Server were reduced 48%, from $2,495 to $1,299. Pricing on the Software Development Kit was cut by 40%, from $995 to $599.

According to Joel Applebaum, president and chief executive officer of Univel, based here, the price cuts were designed to make UnixWare more attractive to mainstream users, as well as traditional Unix users. "We originally positioned this product within the Unix [marketplace]," he said, where it was priced aggressively against other Unix offerings. "But it wasn't priced aggressively in the PC [marketplace]."

"If pricing was an issue, it shouldn't be anymore," said Kan-

DMTF releases spec, plots course for new products

By Caryn Gillooly
Senior Editor

WASHINGTON, D.C. — The Desktop Management Task Force (DMTF) has released a new version of its preliminary Desktop Management Interface (DMI) specification, and group members have released specific implementation plans for future products based on the specification.

The group expects to have a beta version of the DMI specification ready in May or June, with possible product introductions as early as the third quarter.

The DMTF is an industry body whose primary objective is to help standardize management of desktop machines on local and enterprise nets. This will be done through the release of an application program interface set — the DMI — to which vendors will write management applications. These applications, in turn, will collect information about a variety of desktop hardware and software components that can then be sent to a central DMI-based management console.

Vendors involved in the group include Digital Equipment Corp.,

Microsoft turns up heat in NOS contest

Firm focuses on next round of enhancements, including new versions of NT and Windows 3.0.

By Fredric Paul
Senior Editor

REDMOND, Wash. — Microsoft Corp.'s introduction of the Beta 2 release of Windows NT earlier this month once again upped the ante in the competition among network operating systems (NOS).

But the new Beta, and the upcoming release of Windows NT and Windows NT Advanced Server, are merely Microsoft's first wagers in a new round of NOS upgrades and enhancements.

Even as the Beta 2 version of NT hits the streets, Microsoft has a second team of developers working on the next release of the Windows NT operating system, code-named Cairo, and is working on new versions of Windows 3.1, referred to as Chicago. Slated for release in 1994, these new versions will add levels of network functions to Microsoft's existing environments.

"The next step is to make the physical topology [of the network] transparent to the end user," said Paul Maritz, senior vice president of Microsoft's systems division, addressing a Microsoft developers conference in Orlando, Fla.

Users will no longer need a sense of where resources are located on the net. This structure not only makes work group applications possible, Maritz said, but means that "all applications will be work group applications."

Also at the developers conference, Bill Gates, Microsoft's chairman and chief executive officer, said the versions of Windows will have increasingly powerful work group connectivity features built in.

Tracing the development of these functions, Gates explained that Windows' original copy-and-paste function was enhanced to become Dynamic Data Exchange (DDE) and then network DDE.

Bill Gates

Eventually, DDE was joined by Object Linking and Embedding (OLE).

The next enhancement is OLE 2.0, which Gates called a key step "on the road to Cairo." OLE 2.0 is a distributed object process, allowing seamless integration of off-the-shelf software into custom networked applications. To the user, the combination appears as a single application.

OLE 2.0 will provide a programming language to control applications no matter where they reside on the network. In-place activation will let users edit documents without calling the new application. The menus will change to reflect the capabilities of the new application coming over the network.

Maritz said Cairo will "raise the bar for network functionality" with the addition of distributed system capabilities. Cairo is designed to unify Windows NT's file and directory systems and object storage scheme into an object-oriented platform.

Despite the big changes, Maritz promised that Microsoft will introduce the new functions incrementally and that all Windows NT applications will run on Cairo.

Users of these new Windows environments will be able to reach out to other services on the network via Microsoft's Windows Open Services Architecture (WOSA), the vendor's strategy to enable desktop applications to interact with information across the corporate network.

WOSA consists of standard application program interfaces (API) and service interfaces, the software equivalent of device drivers. This set of interfaces will provide access to networked databases via Open Database Connectivity drivers, as well as messaging, security, printing, directory and other services. Gates promised that Microsoft "will

Microsoft turns up heat in NOS contest

make drivers available at a low cost to reach out to these [databases]."

Of course, all of these plans are predicated on the success of Windows NT.

Maritz described NT as "the first operating system in the PC tradition with the technical underpinnings to serve client/server, mission-critical and enterprise-wide needs." Microsoft hopes to use NT and its progeny to "unify personal computing and corporate computing," he explained.

When commercial versions of Windows NT and Windows NT Advanced Server hit the market later this year, they will become part of a portable, scalable family of operating systems for everything from hand-held pen-based computers to high-performance Reduced Instruction Set Computing and Pentium servers equipped with "as much power as any computer has ever had," Gates said.

All of the versions will share both a common API and a common graphical user interface where appropriate, Maritz added.

Eventually, the company hopes to extend Windows and the Windows interface to many different office devices, including facsimile machines, private branch exchange systems and telephones.

According to Gates, Windows will help bring voice mail, fax and electronic mail together. Users will be able to receive their messages on a personal computer or just a smart phone, he added. And that's only the beginning. Microsoft intends to "build versions of Windows for anything," Gates said. ∎

DMTF releases spec, plots product course

Hewlett-Packard Co., IBM, Intel Corp., Microsoft Corp., Novell, Inc., SunConnect and SynOptics Communications, Inc.

"Microsoft is basing its new Systems Management technology on DMI standards," said Ruth Warren, senior product manager for Enterprise Services at Microsoft in Redmond, Wash. "By using DMI interfaces, the automated inventory collection system will be able to track any new objects that follow DMI standards."

The Systems Management support is expected to be in place by the second half of the year, she said, and Microsoft plans to implement the DMI specification within Windows. Although she would not specify when Windows would become DMI-compliant, Warren said support would let "any DMI-based management system manage all third-party products with DMI-compliant components on Windows desktops."

Other vendors revealed DMI implementation plans, too. Intel, for example, plans to implement the specification "on all of our networking products, including LAN adapters, our StorageExpress backup server and the next version of our LANDesk Manager software," said James Johnson, co-general manager at Intel.

But the group is not without problems. During its meeting at INTEROP 93 Spring, the issue arose as to whom should create the Management Information Formats (MIF), or agents, which are needed for the DMI to manage each device.

For example, if various adapter vendors want to write MIFs for their products, it would be difficult to define a single MIF for all adapters, which is ultimately necessary if all adapters are to be recognized by higher end management products.

A DMTF spokeswoman said the group recognizes the MIF confusion and is trying to ensure that standard MIFs are written, but no specific steps have been taken. ∎

Univel chops UnixWare prices

wal Rehki, executive vice president at Novell. "Novell wants to convey the message that we are serious about this [product]."

Applebaum added that to be competitive in the corporate personal computer arena, UnixWare needed to be able to run Windows applications. Previously, users had to buy an add-on called MS Windows Merge, costing $395, to run Windows applications under UnixWare. Now the capability is built in (see graphic, page 13).

"Our requirements are for cost-effective system software that is stable, highly compatible with our existing application universe, yet capable of fully utilizing the power of advanced computer hardware," said Cliff McCartney, supervisor and systems analyst of information technologies at Delta Air Lines, Inc. in Atlanta. "Products such as UnixWare are delivering the necessary technology component, but cost-effectiveness is imperative."

Applebaum said Univel is working with several PC vendors to bundle UnixWare into their products, although he would not provide further details. ∎

INTERNETWORKS

LAN-TO-LAN AND LAN-TO-WAN EQUIPMENT AND STRATEGIES

Link Notes

Chipcom Corp. last week announced an agreement with Xerox Corp. under which Xerox's Network and Professional Services organization will resell Chipcom's ONline System Concentrator intelligent hub family throughout the U.S.

SynOptics Communications, Inc. last week reduced prices across its entire line of LattisNet System 2000 Fiber Distributed Data Interface work group intelligent hubs. For example, the price of the Model 2912A, which has 12 shielded twisted-pair ports and two fiber links, has been slashed by 36% to $9,995.

In addition, the company cut prices on the FDDI modules for its LattisNet 3000 intelligent hub. The Model 3904 FDDI Fiber Optic Host Module now costs $5,495, while the Model 3901S-04 FDDI Network Management Module is priced at $9,995.

HP attempts to lower fiber connectivity costs for users

New transceivers may save up to $900 per link.

By Skip MacAskill
Senior Writer

PALO ALTO, Calif. — Hewlett-Packard Co. last week introduced a fiber-optic transceiver that it claims will reduce the cost of bringing Fiber Distributed Data Interface and Asynchronous Transfer Mode (ATM) technologies to the desktop by as much as $900 per user.

The company's HFBR-5104/5203 fiber transceiver, which costs 75% less than traditional fiber-optic transceivers, uses a nonstandard approach developed by HP that helps reduce the costs associated with running fiber to the desktop.

"Users are shying away from technologies like FDDI and ATM because the end-to-end connection costs are astronomical," said Tim Bour, HP's fiber-optics marketing manager. "In order for users to embrace those fiber-based technologies, the costs of those connections need to be equivalent to copper prices."

Typical fiber transceivers are priced in the $600 to $750 range, but HP's models would debut in the $140 to $250 range, providing users with upward of $900 in cost savings per end-to-end connection using two transceivers.

To make its transceivers more cost-effective, HP reengineered the circuitry so the new model will support wavelengths of 850 nanometers instead of the standard 1300-nanometer length.

This change reduces the maximum distance between network devices from 2 km to 150 meters; however, HP contends that is more than enough for the hub-to-workstation portion of the connection.

"The distance from the desktop to the hub in the wiring closet is rarely more than 100 meters, so why force users to buy a transceiver that meets the 2-km specification?" Bour asked. "That makes sense for the backbone connections between hubs, but if

Star-Tek adds analysis tool set to net mgmt. package

By Skip MacAskill
Senior Writer

WASHINGTON, D.C. — Star-Tek, Inc., a wholly owned subsidiary of 3Com Corp., has rolled out a new version of its token-ring management system that provides tools for problem detection and resolution.

Announced at INTEROP 93 Spring here, Star-Tek Network Management (STNM) Version 2.1 allows a user to access and analyze all token-ring Remote Monitoring (RMON) information compiled by RMON agents on Star-Tek token-ring hubs.

"RMON capabilities give the user a complete view of the token-ring network, and the new tools allow the user to access a wide variety of information for planning and baselining," said Peter Williams, Star-Tek's president. "STNM 2.1 will help the user detect a problem, analyze it and work toward a solution."

The highlight of the new tool set is the History Tool, which taps into a station history RMON group developed by Star-Tek. History Tool allows the user to archive traffic and analyze error trends for individual token-ring devices for up to two weeks.

The stored information can be viewed in intervals of one day, two hours or one minute. That aids in analysis and enables a user to take steps to avoid potential problems. The application can also be used to troubleshoot a problem after a failure takes place. The network manager, for example, can go back and view the activity of the network just before the failure occurred.

STNM 2.1's Packet Capture Tool captures packets for any device on the ring remotely, eliminating the need for an administrator to travel to a remote site with a network analyzer. By defining filters and downloading the filters to an RMON agent on the end device, a net manager can specify what packet types the

Securing the network
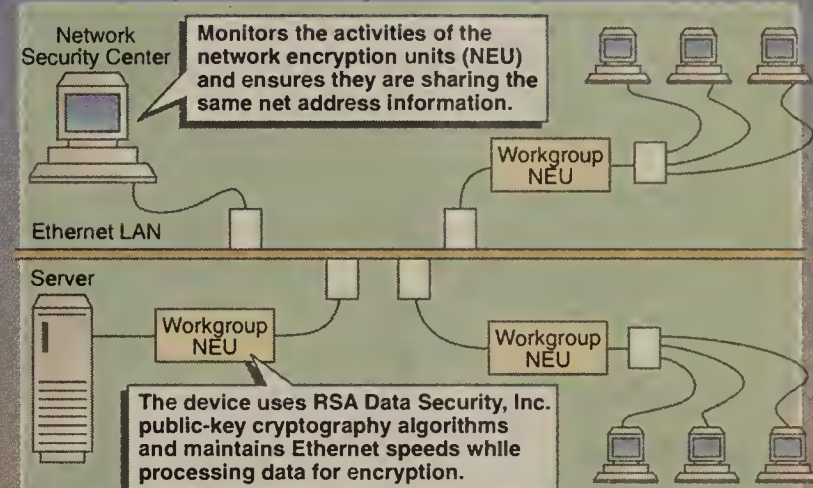
Microsoft deploys Semaphore Workgroup encryption devices on Ethernets carrying sensitive corporate data, enabling these sensitive-data LANs to be integrated into the company's internet of 500-plus nodes.

GRAPHIC BY SUSAN J. CHAMPENY   SOURCE: SEMAPHORE COMMUNICATIONS CORP., SANTA CLARA, CALIF.

Device mainstreams sensitive data on net

Semaphore's Workgroup public-key encryption devices eliminate the need for separate nets.

By Ellen Messmer
Senior Correspondent

REDMOND, Wash. — Microsoft Corp. this month began installing public-key encryption devices on Ethernets carrying sensitive data, allowing those local-area networks to be integrated into the company's global internetwork.

Microsoft is one of the first users of Network Security System Workgroup encryption devices from Semaphore Communications Corp., and its backing is an important endorsement of public-key technology. Security considerations had forced the software giant to keep these sensitive-data LANs separate from its larger global internet, but data encryption will allow Microsoft to bring them into the mainstream of its 500-node LAN internet.

"Having separate networks is tough to support," said Dave Leinweber, director of global networking at Microsoft. "We have a couple of places with parallel networks separate from the corporate network due to the sensitivity of the data."

Accounting and personnel information are two key areas where data protection is particularly significant, he added.

Microsoft earlier this month began installing 19 of the Workgroup encryption devices, the first Semaphore product introduced in January for the Network Security System product line.

Microsoft plans to use up to 50 of the devices in what is the firm's first step into data encryption.

Each Workgroup network encryption unit (NEU) attached to an Ethernet LAN will encrypt the data as it leaves the LAN and decrypt it as it arrives. The process occurs with no end-user intervention. The NEU can protect data on a mainframe, minicomputer, workstation or server.

Semaphore, a Santa Clara, Calif., subsidiary of Xerox Corp., is an RSA Data Security, Inc. licensee, and the Semaphore NEUs use the full range of RSA public-key cryptography features.

Users on the protected Ethernet LANs will have their transmitted files checked for content integrity through the message digest function, electronically "signed" using a digital signature and encrypted for confidentiality. Public-key systems, unlike private-key systems, use dual keys: one private and the other public.

The processing power of the NEU and the VLSI Research, Inc.'s Digital Encryption Standard permits the device to maintain Ethernet speeds even while processing the data for encryption. Bill Ferguson, vice president of marketing at Semaphore, said the encryption, message digest and signature functions add about 5% overhead to data traffic.

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NationsBank is the fourth-largest banking company in the U.S. One telling measure of that size shows up in their network, where their remarkable growth over the last decade has had people changing offices or computer equipment at a move-and-change rate significantly above average for the industry.

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The floor modules tilt up for direct access to power (isolated ground and standard outlets for each workstation), and to the

AMP Access Floor Workstation Modules and AMP Communications Outlets give NationsBank freedom from obsolescence, allowing moves and changes in seconds.

communications outlets. The modules are located on the corners of floor tiles, which can be rotated to adjust for furniture and workstation position. The modules can also be relocated 10 feet in any direction, to accommodate changes in floor layout.

The result for NationsBank is a premises wiring system that gives them total flexibility

in moves and changes – and the speed they need to maintain both their strong customer focus…and their phenomenal growth.

For more information about the AMP NETCONNECT Open Wiring System, call 1-800-522-6752 (fax 717-968-7575). AMP Incorporated, Harrisburg, PA 17105-3608. In Canada, call 416-475-6222.

THIS IS AMP TODAY.

AMP

HP tries to lower connection costs
continued from page 15

we want to get those fiber costs down, we need to relax some of the specs."

In light of that, HP will be submitting its 850-nanometer wavelength technology for consideration by the ANSI's FDDI standards committee.

In addition, the company will offer the HFRB-5103/5205 backbone transceiver, which meets the 1300-nanometer wavelength standard and can be used for those hub-to-hub and hub-to-server connections that are more apt to be 2 km apart.

HP will begin shipping both the HFRB-5104/5203 and HFRB-5103/5205 transceivers in the second quarter, with pricing around $140 and $260, respectively. ◪

Star-Tek adds analysis tool set
continued from page 15

agent captures.

Those packets can then be uploaded from the RMON agent and analyzed by STNM 2.1 or saved to disk as a Network General Corp. Sniffer file for later evaluation by third-party tools.

A new Traffic Matrix Tool identifies potential bottlenecks by displaying traffic between pairs of end nodes on the ring. A table lists each station and the number of other stations it communicates with. Through these tables, the net manager can create a network baseline that can be used for comparative purposes.

By assessing these tables, for example, net managers can make adds, moves and changes more efficiently by placing stations that communicate more frequently with each other closer on the network.

The Protocol Breakdown Tool gives the net manager a percentage breakdown of the protocols in use on the network in a graphical format.

STNM 2.1, which supports the Simple Network Management Protocol and can be used to manage Star-Tek's token-ring products as well as any SNMP-based device from third-party vendors, runs on any 386-based personal computer or higher.

The new tool will be available later this month and will cost $2,995. ◪

Link Notes
continued from page 15

Apertus Technologies, Inc. has rolled out a NetWare for SAA module for its DataCenter Hub that will allow users to support as many as 3,500 NetWare for SAA sessions, which provide interfaces from the IBM world to NetWare environments. The module is based on a 486-MHz processor and offers five Extended Industry Standard Architecture slots per module for local-area network connectivity.

The module will be available in early summer, with prices starting at $11,750.

Device merges sensitive data
continued from page 15

keeping track of which user has which key — is much simpler with public-key systems than private-key ones, there's still some effort involved. Administration of the public-key system is handled through the Network Security Center, a tamper-proof OS/2-based system supporting Oracle Corp.'s database, to keep track of the public-key users.

Network managers must ensure that a table of network addresses is loaded into the Network Security Center, which, in turn, automatically distributes the list to the NEUs on the network. "They exchange public keys so they know one another's digital certificate or signature," Ferguson said. "The NEUs are constantly polled by the network encryption center."

If data arriving on a LAN has been tampered with or is not encrypted, the box stops the message and activates an alarm.

"We haven't seen products comparable to this," said Leinweber. "From our perspective, the Semaphore folks are the first ones to address the encryption needs of the enterprise Ethernet network."

The Semaphore Workgroup and Workgroup Plus equipment — priced at $220 and $160 per node, respectively — is manufactured by AT&T, which plans to sell its own version of Workgroup, Ferguson said. Semaphore is also involved in a joint venture with IBM to develop encryption units for individual workstations, likely to be cards that fit into a workstation slot, as well as a token-ring version of the Workgroup LAN product. ◪

3Com Corp. added new capabilities to its NetBuilder line of routers, including Novell, Inc.'s IPX Service Advertisement Protocol (SAP) filtering and an X.25 connection and gateway service.

SAP broadcasts typically consume inordinate bandwidth and are used to notify routers and, ultimately, end users concerning the availability of NetWare services. The IPX SAP filter enables the router to restrict SAP traffic to specific sections of the net and conserve capacity.

The X.25 connection service lets the NetBuilder router act as an X.25 gateway, enabling users to employ X.25 to establish a maximum of 128 Telnet sessions as well as concurrently route other traffic, such as Internetwork Packet Exchange, over X.25.

The enhancements are available now as part of software Release 6.0, with pricing ranging from $250 to $2,000.

Proteon, Inc. announced that it has joined the Token Ring Interoperability Lab to ensure that its line of intelligent hubs and network interface cards are interoperable when deployed in a multivendor net. ◪

3Com's new hub is also a hub, a

IBM, ISVs whip up support

continued from page 11

systems software vendor in Uniondale, N.Y.

IBM has been garnering new support in recent months. Cross-Comm Corp. last month licensed APPN NN and said it will combine its Protocol Independent Routing software with APPN NN to provide nondisruptive routing of APPN packets, which would be a first for an APPN net.

Other vendors, such as Wellfleet Communications, Inc. and Advanced Computer Communications, have also stated their intentions to license NN.

"There has been a tremendous increase in the number of router vendors interested in APPN," said Steve Joyce, advisory programmer and manager of IBM's Advanced Program-to-Program Communications market enablement division.

So much interest has been generated that IBM is forming an APPN Implementors Workshop, which is expected to include most of its third-party APPN partners such as Apple Computer, Inc., Network Equipment Technologies, Inc. and 3Com Corp.

But while IBM has made significant strides in the acceptance of APPN, these are not yet the days of wine and roses for APPN, industry observers said.

"Getting 3270 users over to APPN will be one of IBM's greatest challenges," said David Passmore, vice president and service director with Gartner Group, Inc., a consultancy in Stamford, Conn. "SNA traffic will continue to be dominated by 3270 applications for the next five years."

IBM has promised 3270 support within APPN through its Dependent LU Server/Requestor (dLS/dLR) technology in the future. Essentially, dLS/dLR encapsulates 3270 data streams in LU 6.2 for transmission across an APPN net.

There will be much more SNA user interest after IBM fills the biggest hole in its APPN technology, which is the lack of APPN support on the mainframe. VTAM 4.1, scheduled to be available in June or July, will finally let users implement APPN in the mainframe communications complex.

"That piece of technology is the big 'wait and see' for most SNA users," Nye said. "But as long as IBM continues to work with third-party software developers to fill in APPN gaps, APPN will be implemented faster." **Z**

Tivoli pack eases mgmt.

continued from page 11

John Hime, Tivoli's vice president of marketing.

Overall, the new services are intended to help systems managers ensure configuration consistency and uniformity while more easily accommodating network growth, Tivoli said.

The new configuration and change services can only be used with Tivoli's systems management applications. Tivoli/File System Management (FSM) is the first application to support the new services.

Tivoli/FSM provides a central point of control for managing Unix client/server file sharing mechanisms, the series of relationships that give users access to network data. The change and configuration services of Version 1.6 allow Tivoli/FSM to set up, manage, change and maintain network file systems more easily than before, the company said.

"A systems administrator has to export file systems from a series of servers and essentially import or mount those file systems on every client that wants access to them," Hime said. "And he has to keep track of that on a piece of paper or something."

Using the change and configuration management features of Version 1.6, Tivoli/FSM lets the systems administrator set up a template that defines which file systems need to be exported from servers and mounted on clients. Systems managers can then subscribe machines to that template so the exports and mounts are done automatically, Hime said.

Release 1.6 of the Tivoli Management Environment will be available for Sun workstations and servers in April. A version for HP 9000 Series 700 and Series 800 systems will ship in the third quarter.

Pricing for Release 1.6 starts at $40,950 for a 50-node net. **Z**

DG takes wraps off DCE for Unix

continued from page 11

Cell directory services provide a registry of resources in a particular domain of the distributed network, while the global directory is a registry of all the cell directories. DG's global directory services use the X.500 directory protocol, said Katherine Jones, DCE product manager for DG.

Remote administration services allow users to administer cell directory, global directory and security servers from one centralized console. DG's DCE encryption utility ensures the secure transmission of data and supports the Data Encryption Standard, Jones said.

For file services, DG's DCE products use a homegrown Unix file system and Sun Microsystems, Inc.'s Network File System, Jones said. The OSF has not yet completed a distributed file service for DCE.

DG claims that its DCE products can interoperate with other vendors' DCE wares. But the jury is still out on that since none of the DCE products on the market have been certified to interoperate in a multivendor environment (see "Users voice concerns about DCE products," page 25).

DG expects to ship the DCE Starter Kit and services in the third quarter. Starter Kit pricing begins at $2,950, which includes license, media and documentation. Pricing for individual services starts at $1,000. **Z**

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Lou Bender, Bose 7
Howard Bubb, Dialogic
James Burton, CT-Link
Chuck Codle, Solid State Systems
Carlton Carden, Expert Systems
Ron Charnack, NPRI
Ben Campaine, Novo Systems
Jeff Deneen, Northern Telecom
Bob Edgar, Parity Software
Charles Fitzgerald, Microsoft
Pete Foster, Voice Control Systems
Barry Garsun, Suumo Four
Klaus Gueldenphennig, Redcom Labs
Robert A. Hess, Tekelec
Allen Jocksan, Harris Digital
Chuck Kissner, Aristocom
Ran Kopecki, InteCom
Gary Lidell, Spectrum
Robert Madanna, Excel
Gary Maier, Dianatel
Michael McCafferty, TeleMagic
Peter Merrimon, Mitel
Tom Mikol, Rockwell
Bill Montgomery, Cortelco
Morris Neumon, SpeechSoft
Bob Pokress, Unifi
Art Schoeller, AT&T
Bill Schwartz, XTEND
Stephen Smith, AT&T
Gerald Taylor, MCI
Al Wokas, Rhetorex

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Speakers Nora Long
Attendees Helen Reinhald
Ombudsman Gerry Friesen

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Spring, 1993

Dear Seminar and Exposition Attendee,

Suddenly, everything is possible. "Erector Set telecom" is here. All the building blocks — the bricks — are in place. With these "bricks," you'll be able to build customized telecommunications and voice processing solutions to your heart's desire. Anything you want.

The good news is you can see all the new tools under one roof, all the new products under one roof, meet all the new players under one roof! They'll all be there — at the very attractive Infomart in Dallas, May 4, 5 & 6, 1993.

To list all "the new telecom and voice processing tools" is impossible. I tried putting them all on bricks and constructing a building. See my cover. But every time I showed the cover to someone they'd say, "You've forgotten our new toolkit." Then I'd say, "So give it to me." They'd answer: "Well, we won't announce until Telecom Developers '93."

Great!

Six things excite me about our new industry:

1. All the new players — Apple, Ardis, EO, General Magic, GO, Intel, Microsoft, Novell, Nuts Technologies and Octus — to name just a few of the new players who'll be speaking at Telecom Developers.

2. All the new software tools, new standards, new boards and new open phone and voice processing systems.

3. The enormous increase in power of all the modules — from dramatically improved voice recognition to voice processing systems that can now span multiple PCs.

4. The substantial across-the-board drop in price — for everything from developer toolkits to run-time modules.

5. The fact that action is happening everywhere — at the desktop, on the LAN (the client server model applies), through "dumb" programmable switches and through open "smart" telephone systems (PBXs, key systems, ACDs and dumb switches).

6. The fact is that none of this action is contingent on the deployment of fancy new telephone services, like ISDN, frame relay, SONET, or SMDS. (SW Bell declined to demonstrate ISDN at Telecom Developers '93. It said it lacked the resources.)

We've invited the country's leading thinkers and doers to Telecom Developers '93. We've told them to be very "hands on" in their presentations. Many have told us they'll be announcing new products in Dallas at Telecom Developers '93.

Please join us

Harry Newton

Harry Newton, Gerry Friesen, Rick Luhmann, Ed Leibowitz, Tracey Tucker, Maddy Bodin, Janet Lindsley, Cyndy Ryan, Jim McManus, Rose Bodin and Nora Long

WHO SHOULD COME TO TELECOM DEVELOPERS '93

■ **Telecommunications Professionals** needing concrete information on today's hottest telecom areas.

■ **MIS/Data Processing Professionals** who need to learn more about integrating their computers with telecom equipment.

■ **MIS VARs, VADs, ISVs, Developers, Systems Integrators, OEMs and Programmers** seeking new opportunities, new products and new markets.

■ **Interconnect companies and telecom distributors** seeking new, higher-margin products and services to sell.

■ **Customer Service Managers** needing new tools to improve service to their customers calling in on the phone.

■ **Marketing and Sales Execs** needing new customer-pleasing tools, e.g. dealer locator services, 800 and 900 "gateways," help desks, etc.

■ **Networking Professionals** responsible for computer/telephony/voice processing integration.

■ **Call center managers** seeking to maximize their center's efficiency.

■ **Computer and Telecom equipment manufacturers** seeking developers and partners.

WHERE THE ACTION IS AT TELECOM DEVELOPERS '93
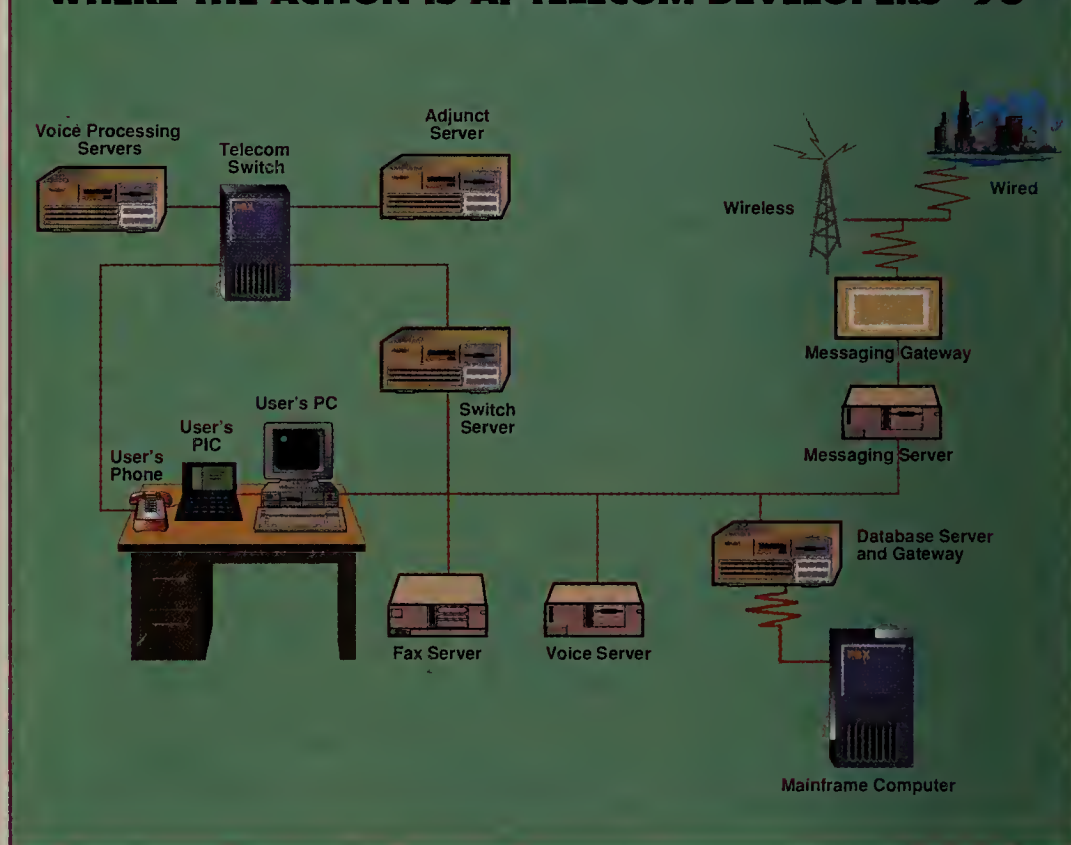
There is open action in four basic arenas — ❶ at the desktop (with wired and wireless devices), ❷ at the desktop in standalone voice and call processing, ❸ on the LAN (the client-server model applies) and ❹ behind the phone at the switch. There is open action at the switch via two methods — real-time circuit-switched and semi-real-time packet-switched. Some telecom areas are fully open, like dumb switches and now call processing devices. Some telecom areas are half-open, with complex ways in, such as PBX to host links. Some telecom areas are starting to open — like the long-distance networks. Everything is changing, as we speak. The movement to "open" and Customized Telecommunications Solutions is inexorable. For more, come to Telecom Developers '93, Dallas Infomart 4, 5 & 6, 1993.

To Register 1-800-999-0345 or 212-691-8215

AM Seminars

8:30 AM to 9:15 AM

ERECTOR SET TELECOM: OUR NEW INDUSTRY OF CUS-TOMIZED SOLUTIONS. WHERE IT STANDS. WHERE IT'S GOING.

Harry Newton, Publisher, TELECON-NECT and CALL CENTER Magazines

Erector Set telecom and voice process-ing is here. It is creating wondrous new customized solutions. It is revitalizing the telecom industry, creating high-margin opportunities for developers, distributors, dealers, users, VARs, man-ufacturers and telephone companies. Powerful dumb switches. Mind-bog-gling PC voice-processing hardware. Flexible application software. Open desktop. New broad standards. The pieces of our new industry are falling nicely into place. Now it's time to start putting them together. Now it's time to bring it all home to the end users. Now it's time to turn our open resources into the $5 Billion opportunity it can become. This talk analyzes the oppor-tunities, pinpoints the pitfalls, and paints the future.

9:15 AM to 10:15 AM

DESKTOP TELEPHONY APIs AND THE FUTURE — SHRINK-WRAPPED DESKTOP TELEPHONE SOFTWARE

Herman D'Hooge, Senior Staff Engineer, Advanced Development Lab, Intel

Charles Fitzgerald, Product Manager Applications Marketing, Microsoft

The concept is simple. The desktop computer makes a fine, intelligent telephone. It lets you dial from databases. It will give you informa-tion on who's calling you. It will let you get access to all your telephone's features by clicking buttons using a mouse — easier than remembering complex codes. It will integrate with all the desktop personal productivity tools — like personal information managers, etc. It's a great personal organizing tool. It's a great comple-ment to your desktop telephone. A telephony API — Application Programming Interface — is a piece of software that (in simple terms) sits between the incoming phone line and application software. The ulti-mate idea is that all desktop tele-phone software will be shrink-wrapped. You bring it to your office, unwrap it, install it on your PC — like a word processing package. But, instead of installing it for the printer of your choice like a word processing package, you install it for the phone system of your choice.

10:15 AM to 10:30 AM

COFFEE BREAK

10:30 AM to 11:15 AM

MACINTOSH TELEPHONY ARCHITECTURE

Michael Bayer, Apple Personal Communications Evangelist

Apple is the first PC maker out with a Telephone Managers Developer's Kit. Its latest Macintosh Telephony Architecture extends the Macintosh operating system to provide a frame-work for computer-telephone inte-gration (CTI), telephony, video con-ferencing, fax, voicemail, electronic mail, directories and personal agents. Through AOCE, the Communications Toolbox and other System 7 technologies, the Macintosh desktop will become the focal point for all personal commu-nications. In this talk, Mr. Bayer will explain Apple's vision of Desktop Telephony. He will introduce you to Screen-Based Telephony, "Telephony-Aware" Applications, Telephone Adapters or PODs, and Telephone Apple Events.

11:15 AM to Noon

COMPUTER-TELEPHONY INTEGRATION: FROM CALL CENTER TO DESKTOP APPLICATIONS

Ryan James, Director of Communications Services, The Yankee Group

Under his direction, the Yankee Group just completed a 120-page study in which it said, "Led by the demand for interactive voice response (IVR) sys-tems and predictive dialing systems, Computer-Telephony Integration (CTI) will expand from $800 million in 1992 to $2 billion by 1997 ... Much of today's perception of CTI focuses on PBX-to-host technologies. Our research clearly shows that switch-to-host inter-faces are a fraction of the total market and that IVR and predictive dialing comprise the largest and fastest-grow-ing segment of the market." The report has four conclusions: 1. The call center remains Number One. 2. CTI is not for call centers alone. 3. Carriers offer increasingly advanced network ser-vices. 4. Integrated messaging is the "killer" application. Mr. James will pre-sent a detailed overview of his findings.

Noon to 2 PM — Luncheon Talk

THE HOWARD BUBB SHOW

Howard Bubb, COO, Dialogic Corp

Howard is our industry's master showman. Here's Howard at his best, demonstrating state-of-the art telecom and voice processing products, pro-jecting his demos onto giant screens. Howard's Dialogic Corp. is the domi-nant supplier of voice-processing and telecom componentry that fits inside a PC. His company Dialogic, which doesn't make end-user products, has

EMINARS

Exhibition hall closed today May 4

PM Seminars

over 1,000 developers worldwide. This presentation, with its attendant theatre, gripping presentation and ultra fast-pace, was a hit of last year's Telecom Developers. This year's presentors are brand-new. Their identity remains a secret until the day of The Howard Bubb Show. Be there.

2 PM to 2:45 PM

LAN-BASED TELEPHONY — NOVELL & AT&T'S VISION

Joe Staples, Telephony Evangelist, Novell

Stephen Smith, Open Desktop Evangelist, AT&T

Endless opportunities are created when you mate LAN and phone applications into a single, integrated package. Voice servers. Fax servers. E-mail, PIM servers, etc. The LAN-based desktop workstation becomes the focus for adding intelligence to corporate telecom. The possibilities are endless. Consider: Novell sells more LANs than anybody and AT&T sells more phones than anybody. Novell wants to sell more LANs and AT&T wants to sell more phones. Guess what? They've teamed up, providing hardware interfaces and a suite of computer/telephony APIs they would like outsiders to develop on. The market is immense. There are an estimated 40 million desktops shared by feature telephone sets and PCs connected to LANs. Both AT&T and Novell have extensive distribution networks, which they plan on using to help sell outsider-developed products.

2:45 PM to 3:30 PM

WHERE OUR NEW OPEN WORLD IS GOING.

James Burton, President, CT Link

Mr. Burton is our industry's great deal maker. He has introduced more peo-

ple, been close to more of our industry's leading players, made more matches, helped set more corporate "Visions," and signed more non-disclosure agreements than any other single person in this industry. In this talk he will lay out his vision for the industry, pinpointing the opportunities and detailing the pitfalls. In his Computer-Telephone Integration News, he forecast 1993 "To be the year CTI will be introduced to the desktop."

3:30 PM to 4:15 PM

THE IMPORTANCE OF BEING STANDARD

Ian MacMillan, Director, Telecom Software Applications, SW Bell

Ron Charnock, Pres., NPRI & ACTAS

Why standards? In a truly "open" world, different bits of hardware and software should work across platforms as easily interchangeable pieces in the Erector-Set-Telecom puzzle. Today, with everybody coming out with their own APIs and other proprietary twists, there's some trouble in that developer's paradise. To complicate things further, a gaggle of so-called "standards" are now hitting the streets. Aiming to fix the problem, they are actually adding to the confusion. Questions: Which are the biggies? What are their stengths? Weaknesses? Which will succeed? Find out what's going down in one of the most important parts of our (relatively) infant industry. Mr. MacMillan is an expert on standards in this industry. Mr. Charnock chairs ACTAS, a trade organization of all our industry's major players. ACTAS's goal is to develop standards in open telephony.

4:15 PM to 4:45 PM

BRINGING IT ON HOME TO THE END USER

Susan Mills, President, Mills Technology Marketing

Okay. You've built the coolest product out of all this Erector-Set Telecom stuff. How do you bring it to market? Here's the fastest, most in-depth MBA course on bringing your new customized "thing" to the end user. Issues discussed: constituencies, credibility, education, leverage, packaging, programs, pricing, etc. Ms. Mills is the founder of Technology Marketing Partners, which provides strategic and tactical market planning and program execution services for computer-telephone integration products.

4:45 PM TO 5:15 PM

ELECTRONIC MAIL: BENEFITS AND IMPLEMENTATION CHECKLISTS

Chris Risley, President, Notework Corporation

Electronic mail — internal and external — is an enormous productivity enhancer. TELECONNECT believes Notework, which we use, to be "The Greatest Little E-Mail Program In The Western World." In this talk, Mr. Risley will explain how to install internal LAN-based e-mail and how to join those LAN-based e-mail systems through gateways to wide-area e-mail systems, like Internet, MCI Mail and ATT Mail. Mr. Risley will also present a checklist of "E-Mail Implementation Mistakes to Avoid."

6:00 PM to 9:00 PM

OPEN COCKTAIL PARTY HOSTED BY DIALOGIC CORPORATION. EVERYONE INVITED.

Track One

8 AM to 9:15 AM

PC-BASED VOICE PROCESSING — AN INTRO TUTORIAL

Bob Edgar, President, Parity Software

Bob Edgar wrote the best-selling book, *PC-Based Voice Processing — How To Design, Build and Program Systems, Using Indusry-Standard Dialogic Hardware.* He is CEO of Parity Software Development Corporation and an authority on software development. Bob has lead Parity in designing and creating VOS, a leading language for building voice processing applications. Bob has created this mini-tutorial specially for people new to voice processing. The tutorial addresses everything from telecom signaling to choosing boards. When you walk out of this seminar, you will feel comfortable putting your first voice processing system together.

9:15 AM to 10 AM

VOICE RECOGNITION

Pete Foster, President, Voice Control Systems

Desmond Pieri, VP Sales & Marketng, Voice Processing Corp.

moderator, Bob Lewis, Minneapolis Star Tribune

Voice recognition is an extraordinary application resource. Instead of forcing people to fuss with touchtone (if they've got it) to get to Interactive Voice Response information or route themselves in a complex Voice Server switching application, they can simply speak their way through things. Throw in the new PC multi-resource platforms and standards that developers are using to tie voice recognition into the rest of our Erector-Set Telecom world and it becomes clear: Voice recognition is becoming common-

place. Where does voice recognition stand today? What are the hottest applications? What can voice recognition be safely used for? What not?

10 AM to 10:15 AM

COFFEE BREAK

10:30 AM to Noon

SCSA — A MAJOR NEW STANDARD

Bob Heymann, VP Technical Product Management, Dialogic

Chuck Buffum, Open Call Center, Tandem Computers

moderator: Bill Schwartz, pres. XTEND

Over 60 major voice and call processing and telecom companies have publicly endorsed SCSA, which stands for Signal Computing System Architecture. This is the largest collection of disparate competitors in this industry ever to agree on anything (except perhaps the RJ-11 plug). This broad agreement is great testimony to SCSA's value. SCSA is an all-encompassing standard, detailing, among other things, how to tie together PC/LANs and workstations and open multi-resource PC voice-processing systems. It also expands up and incorporates virtually all the other standards we've seen in Erector-Set Telecom, including Mitel's ST-Bus, Natural MicroSystems' MVIP, Siemens' PCM Highway and Dialogic's PEB bus. Telecom Developers, in general, and this seminar, in particular, will be the first public demonstration of SCSA in operation.

Noon to 2 PM

LUNCH BREAK AND EXPOSITION VISIT

2 PM to 4 PM

OPEN VIDEO. IT'S ALL OPENING UP!

Chuck Grandgent, Manager System Software, Picturetel

Steve Hawley, Desktop Multimedia, Northern Telecom

Andrew Moyler, Business Manager, Marconi Electronics

Mike Stauffer, New Business Evangelist, Compression Labs

Peter Wagner, VP, NUTS Tech.

All these companies have released Toolkits, which allow developers to incoporate video into their voice/call processing applications. Advances in video compression have made full-color transmission possible on dial-up analog phone lines, but even more possible on low-bandwidth digital lines. Video is exploding. Here's a full status report.

4 PM to 5:30 PM

OPEN PREDICTIVE DIALING

Keith Henderson, GM, SW Div., Sprint

Belinda Buddrus, Comms Analyst, TeleService Resources

Akiva Dar, Pres.TeleRelation Systems

Jeff Pool, VP, Charter Systems

moderator, Bob Lewis, MIS Department, Minneapolis Star Tribune

Predictive Dialing Systems are miracle productivity workers. With a decent manual system, you can put your people on the phone for 25 minutes an hour. With a good predictive dialer, you can kick that up to 55 minutes an hour. Now tie this power into our new open industry. Whammo. More intelligence.. More productivity. Here are two satisfied users and two vendors, who've written software to make a small (100-line key system) into a predictive dialer.

FREE EVENTS IN THE EXHIBIT HALL

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- Free "On Floor" Shootouts

- Free Regular Drawings
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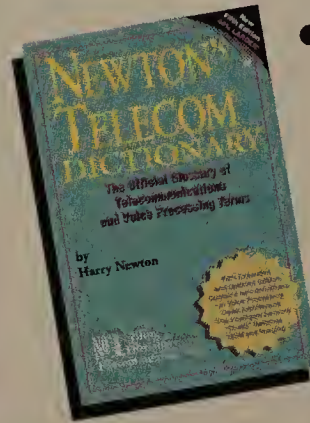
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NEWTON'S
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DICTIONARY

The Official Dictionary of
Telecommunications
and Data Processing Terms

by
Harry Newton

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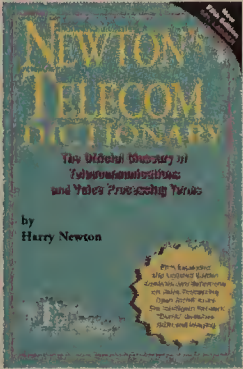
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Exhibition hall Open today May 5

Track Two

8 AM to 10 AM

PC TELEPHONE: THE YEAR OF THE DESKTOP?

Steve Baer, Director Desktop, Bellcore

Nolan Bushnell, Chairman, Octus

Paul Hurley, Chairman and CEO, Cypress Research

Michael Tchong, President, Atelier Systems

Arie Litman, Product Manager, Open Desktop, Rolm

Stephen Smith, Open Desktop Evangelist, AT&T

moderator: Harry Newton Teleconnect Magazine

Will 1993 be The Year Of the Desktop? Many say YES. The desktop PC makes a fine, intelligent phone. You can dial from a database, see who's calling you, get access to all your phone's complex features easily and get all your messages in one place. Microsoft is announcing its Telephony API and Apple has announced its (see May 4 seminars). Here are the leading desktop software makers who will demonstrate their Open Desktop Solutions, and the platforms they offer developers. Three are using the Macintosh as a platform. Three are using the PC.

10 AM to 10:15 AM

COFFEE BREAK

10:15 AM to Noon

MVIP — MULTI VENDOR INTEGRATION PROTOCOL

Tony Bawcutt, VP, Mitel

Stephen Ide, VP, Brooktrout

David Levi, President, Natural MicroSystems

Al Wokas, President, Rhetorex

moderator: Jerry Michalski, Release 1.0

Everything you wanted to know about one of our industry's most widely-accepted voice and call processing standards. Where it stands. Where it's going. Four leading MVIP component card makers explain MVIP in depth. One (Brooktrout) makes fax cards.

Noon to 2 PM

LUNCH BREAK AND EXPOSITION VISIT

2 PM to 4 PM

PROGRAMMABLE INTEGRATED SWITCHES; CHOOSING HARDWARE AND SOFTWARE

Chris Bajorek, President, TRT

Carlton Carden, President, Expert Systems

Gary Maier, President, Dianatel

The two chief pieces of the telecom switching revolution are here: First, unbelievable new PC card digital time-slot switching sources and, second, sophisticated software makes these switches-in-a-PC bark in truly unique ways. You can make customized PBXs, call centers, speciality least cost routers, protocol converters, conferencing units etc. Today a single PC can contain a 384-simultaneous conversation switch. Scattered switches of this power will change telecom switching paradigms. So much that some experts figure it could drop the price of today's PBXs by 80%. This panel contains the leading hardware maker and the two leading software toolkit vendors. Their task is to show us what's possible. This is a serious tutorial on integrated PC-based switching.

4 PM to 5:30 PM

POWERTALK: IT'S ALL IN THE EARPHONE. A RADICALLY NEW HEADSET.

John Armstrong, VP R&D, Applied Engineering

Roger Davis, Product Manager, Visit, Northern Telecom

Randy Granovetter, President, Jabra Corporation

Mike Fairweather, Chairman, UNEX

Michael Tchong, President, Atelier Systems

moderator: Jerry Michalski, Release 1.0

Two companies are introducing earphones -- which are combination earphones/headsets. They have the potential of truly revolutionizing the way we use communications devices. TELECONNECT Magazine tried both earphones and was very impressed. "PowerTalk in the '90s "means talking through a smaller, more portable and flexible combination earpiece/headset. A headset that's physically just an earphone. These devices will drop into video-conferencing, cellular notebooks, personal communicators, voice messaging, voice activation , call centers and find their way onto executives' desks. Here are representatives from companies which have installed earphones in Apple cellular Powerbooks and Northern's Visit videoconferencing devices, amongst other places.

6:00 to 9:00 PM

OPEN COCKTAIL PARTY HOSTED BY AT&T. EVERYONE INVITED.

Track One

8 AM to 9:30 AM

AT&T & NORTHERN DUKE IT OUT

Jeff Deneen, Norstar Evangelist, Northern Telecom

Stephen Smith, Evangelist, Applications Partner Program, AT&T

moderator: Harry Newton, publisher, TELECONNECT Magazine

The two biggest sellers of under-100 line phone systems each have developer programs and open switches. AT&T has its Applications Partner Program for its Merlin Legend and Partner phone systems. Northern has its Access Toolkit Program for its Norstar. Both are actively seeking developers. Both offer their developers significant benefits, including potential assistance in distribution and sales. AT&T says its "intent is to provide the best possible environment for the development of a variety of applications. The more flexibility we can offer our customers the better we can support their business needs." Northern says similar things. Come and learn which one suits you better.

9:30 AM to 9:45 AM

COFFEE BREAK

9:45 AM to 11 AM

ADSI — A VERY IMPORTANT NEW STANDARD

Richard Davis, Chief Technical Officer, Radish

Dave Werling, Manager, ADSI, Northern Telecom

Martin Zary, ADSI Evangelist, Dialogic

plus two ADSI users

ADSI stands for Analog Display Services Interface. It may be the most important new standard in our industry. In a nutshell, it puts on a screen — telephone or PC — what you're hearing on the phone. It lets users access touchtone-driven interactive voice response (IVR) applications a lot easier. Northern is building ADSI phones. Others will too. Best yet, it requires absolutely no deployment of special lines by today's local phone companies. Where does ADSI stand today? Read all about ADSI on page 12. Come to the session. See ADSI demonstrations in the Exposition Hall.

11 AM to Noon

CALLER ID/ANI/DNIS APPLICATIONS

Gilbert Amine, President, Rochelle Communications

Jim Burton, President, PTA

Bob Grohovsky, Norstar Caller ID Evangelist, Northern Telecom

26 states and all of Canada's cities now have multi-line caller ID approved and available — total of 40 million lines. This means a phone call coming into a business hunt group will carry its caller ID. Equipment hooked to the lines can grab the caller ID and use it to do a database lookup and/or an intelligent call transfer. Rochelle's hardware and software (incl. developer toolkits for DOS, Windows, OS/2 and Macintosh) will caller ID-enable any key system or small ACD. Northern Telecom's Norstar phone system has just come out with Design Release 5. With it, a developer can read the incoming caller ID off Norstar's D channel. Mr. Burton has a new idea for a universal caller ID service — one that won't be dependent on local phone companies and regulatory approval.

Noon to 2 PM

LUNCH BREAK AND EXPOSITION HALL VISIT

2 PM to 4 PM

LAN-BASED VOICE SERVERS

Bard Richmond, President, Active Voice

Dennis King, Mixed Media Messaging Manager, Applied Voice Technology

Ian McCalla, President, The Vmail Company

The vision is simple: Come to work in the morning. Turn on your PC. See the screen fill with all your messages — voice, fax, video, e-mail, calendaring, group scheduling, etc. Voice Servers will change the way we deal with our sundry messaging media. They will ease the information overload constantly squeezing us. By connecting us to a LAN message processor, they'll add intelligence to our daily lives. The bad news: it's tricky stuff, with most of it still in beta. The great news: The technology is available today and the beta-site end users are going bonkers over it.

4:00 TO 5 PM

FORTUNE 2000 VOICE MAIL SYSTEMS; NOW OPENING UP

Dave Weinstein, VP Marketing, Centigram

Dick D'Soto, TeamWorks Program Manager, VMX

Jim Jennings, VP, Octel

The large voice mail companies, who have made a handsome living selling large voice mail systems to the Fortune 2000, are now opening up and actively courting developers. These companies have huge installed bases. Here's your opportunity to compare their developer programs and find the one that suits you.

EMINARS

Track Two

8 AM to 9:30 AM

SWITCH-TO-HOST INTEGRATION: STEPS TO SUCCESS

Greg Borton, President, Nabnasset

Ajoy Khandheria, CTI Evangelist, Harris Corp.

Chuck Kissner, President, Aristacom

Bill Monroe, CTI Evangelist, Tekelec

Moderator: Bill Schwartz, President, XTEND

There are many reasons a computer, not an operator, should control the flow of calls in a telephone switch — PBX or call center. Those reasons fall squarely in the court of servicing the end user more efficiently. The switch can send calls to the appropriate agent based on who's calling. There are even bigger benefits when the switch is front-ended with a voice response system. Two companies lead in providing the complex software for switching large systems under control of mainframe databases — Aristacom and Nabnasset. Tekelec provides equipment for testing of CTI (Computer Telephone Integration) links. Nearly every PBX today has a gateway. Who's got it down? Which switches are easiest to work with? Which telecom/computer partnerships are creating the most cutting-edge customer-coddling solutions? What are the lessons users should learn?

9:30 AM to 9:45 AM

COFFEE BREAK

9:45 AM to Noon

WIRELESS MESSAGING

Wayne Dyer, Evangelist, EO, Inc.

Mike Homer, VP Marketing, GO Corporation

Frank Wapole, President,

ARDIS/Motorola

James White, VP Communication Engineering, General Magic

Each day 40% of Americans are on the road, out of their office. The concept is simple: Give them a device they can carry that will receive messages. Allow them with the same device to transmit messages, unburdened by the need to find a landline with an RJ-11. ARDIS has the network. GO and General Magic have the software platforms. EO is making the hardware. Each are looking for developers, for end users, for people who can share their Visions. Wireless messaging is among the hottest topics in telecom today. Here four leading new, entrepreneurial wireless companies explain their exciting Visions.

Noon to 2 PM

LUNCH BREAK AND EXPOSITION HALL VISIT

2 PM to 4 PM

OPEN ACDS: YOUR OWN AND OTHERS

Richard Drews, Pres., The Renaissance Group

Chuck Buffum, ACD Evangelist, Tandem Computers

Carlton Carden, President, Expert Systems

Brian Downey, VP, Cintech

Mark Foster, President, Base 7

Steve Langford, Director, Sales & Marketing, Norlite Technology

Chris Prada, President, Innings Telecom

moderator, Bob Lewis, MIS Dept., Minneapolis Star Tribune

Automatic Call Distributors (ACDs) are increasingly the first point of

contact for the world's customers. How that incoming call is handled will determine whether you retain the customer or lose him and all his friends. ACDs can cause more customer damage than any other single piece of technology. Today, there are — thankfully — many ways to customize an ACD into the great-customer-pleasing tool it should be. Our speakers cover the waterfront — from large ACDs to build your own ACD in a PC. Mark Foster's company will connect you to your long distance company's Signaling System 7, a huge plus.

4 PM to 5:00 PM

MISTAKES TO AVOID IN VOICE PROCESSING

Chris Bajorek, President, Telephone Response Technologies

Elhum Vahdat, VP Marketing, Apex Voice

Les Veal, VP, InterVoice

How about a voice processing system running under UNIX? Or DOS? Or Windows NT? Or one supporting European E-1s? An Application Generator? A High-Level Script Language? What about low-level coding in C? What are the mistakes to avoid in buying hardware? There are a million alternatives. We asked three experts to bring their best "Voice Processing Checklists." Tell us all their mistakes and what they learned.

ADSI -- A GREAT NEW STANDARD

by Harry Newton

ADSI stands for Analog Display Services Interface. ADSI puts on a screen what you're hearing on the phone.

"Push 1 for your checking balance," says your bank's voice processing system, "Push 2 for your savings balance; push 3 for your last check; push 4 for your..."

ADSI puts these choices on a screen in front of you. Study them. Choose which you want. Push your touchtone button. ADSI is God Sent. I relish the day every voice processing, voice mail, auto attendant, audiotext system will have it. It promises to make my life (and yours) so much easier.

I want a screen with big type to help me muddle through. That's what ADSI is. A screen of information I can muddle around in, searching for my perfect choice. This is not rocket science. Everybody can understand ADSI. Every voice processing system can support it. It's not dependent on the local phone company to do anything, like install new lines (what's holding up ISDN and switched 56).

You can run ADSI on every phone line in North America today -- without modification, without any phone company -- local or long distance -- ever knowing about it. This is great cause for comfort. You will need a new phone, an add-on display for your existing phone, or very simple software for your PC (Mac or IBM).

Here's how ADSI works: You call "Bank by Phone." (Northern has such a trial with the Bank of Boston.) The bank's voice processing system answers and asks for your password. You respond by punching a touchtone button. That's how it works today. And that's how it will continue to work. ADSI works by simply sending back words and numbers to your phone's display, "Touchtone your password."

ADSI will give you a whole bunch of words and numbers on your screen. How many? Ah, ha. That's the power of ADSI. After (or before) it has verbally told you your options, it sends a block of data to your phone. That block is called an Information Page. It can be as big as 33 lines long by 40 characters wide. That's a fair bit of information. A typical screen on an MS-DOS text-based screen is only 25 lines by 80 characters wide.

Information Page Mapping. The distant ADSI-generating device (voice-processing system, central office, bank by phone, etc.) sends an Information Page to your phone. The page is 33 lines x 40 characters. The phone you own can have a display from 1 line x 20 characters all the way to 33 lines by 40 characters (in which case it would probably be a PC). This chart, courtesy Dave Werling of Northern, shows how ADSI-compatible phones "map" the incoming Information Page to the display of the phone.

This shows the essentials of an ADSI phone, sadly called a terminal. The minimum display is 1 line by 20 characters. You need a minimum of three softkeys and four navigation keys. Don't you just love the new ADSI words like navigation? By the way, sorry for the small type in this month's To The Industry. These standards are so important that I wanted to get them all in. We'll go back to our standard type next month -- Harry.

How much of these 33 x 40 characters you'll see on your screen depends on the size of your phone's screen. Northern's Prototype has 3 x 20. Northern's phone has memory to hold all 33 or 40 characters, and it has scroll buttons to let you scroll up and down and side to side and read all 33 x 40 characters.

There are navigation keys. There's one set for pushing you up and down the information page. There's another for moving you side to side.

The voice processing system (not the central office) sends the ADSI information page to your phone in a quick burst of data. You won't hear anything. Your handset is muted temporarily while the ADSI data comes in. A nice touch.

The flexibility of the ADSI standard allows enormous flexibility in the design of ADSI phones and the design of ADSI services.

Come see ADSI at Telecom Developers '93.
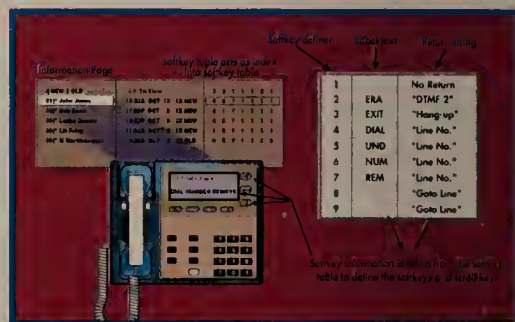
Softkey Mapping. Typically the bottom line of an ADSI-compatible phone shows words in reverse type which relate to the function of the key at that particular moment. Here we see three keys mapped to "Dial," "Number," and "Remove." Hit one and you'd dial a number, etc.

Will 1993 Be Telecom's Year Of The Desktop?

by Harry Newton

Should you run a phone from a phone, or a PC (Macintosh or Microsoft PC)? Many new companies -- ones you'll see at Telecom Developers -- are betting you'll run your phone from a PC. At Telecom Developers you'll see new Telephony APIs (Application Programming Interfaces) and many "phones-on-a-card."

There are good reasons for believing 1993 will be the Year of The Desktop. Here are some things you can do on a PC you can't do a phone.

1. Dial by name. Dial hundreds of people one after another by name or by some characteristic (e.g. all those who responded to your widget ad).

2. Answer, reply to and manage your voice, fax, video, electronic and image mail on one screen with one keyboard.

3. Run your voice mail like you do your cassette recorder with forward, reverse, play buttons -- instead of "push 5 for play, 7 for rewind."

4. Send your voice mail to people, not extension numbers. Transfer your calls to people, not extension numbers.

5. Do videoconferencing on the same screen you do spreadsheets.

6. Find out who's calling you, what you last spoke with them about, and how much they bought from your company before you ever pick up the phone.

7. Selectively handle your callers before you answer -- from sending some to your voice mail, to sending some to your subordinates, to having some reach your beeper, to having some crash through your present conversation.

8. Do many tasks with voice recognition through your headset or handset and the software in your voice board-equipped PC.

THE DALLAS INFOMART

The Infomart is a building with permanent exhibits (housed in suites) by 101 high-tech companies. You'll be able to visit these companies when you visit TELECOM DEVELOPERS '93.

The Infomart owes its unusual and wonderful architecture to the Crystal Palace, which for more than 80 years, until 1936, was a landmark in London. The Crystal Palace was built in 1851 for the first World's Fair and international technology exposition. It burnt down in early evening November 30, 1936. No one knows how. (It was mainly glass.) Dallas's Infomart, however has been recognized by Great Britain's Parliament as the Crystal Palace's official successor. Whatever that means.

AN EASY WAY TO MAKE PHONE SYSTEMS "OPEN"
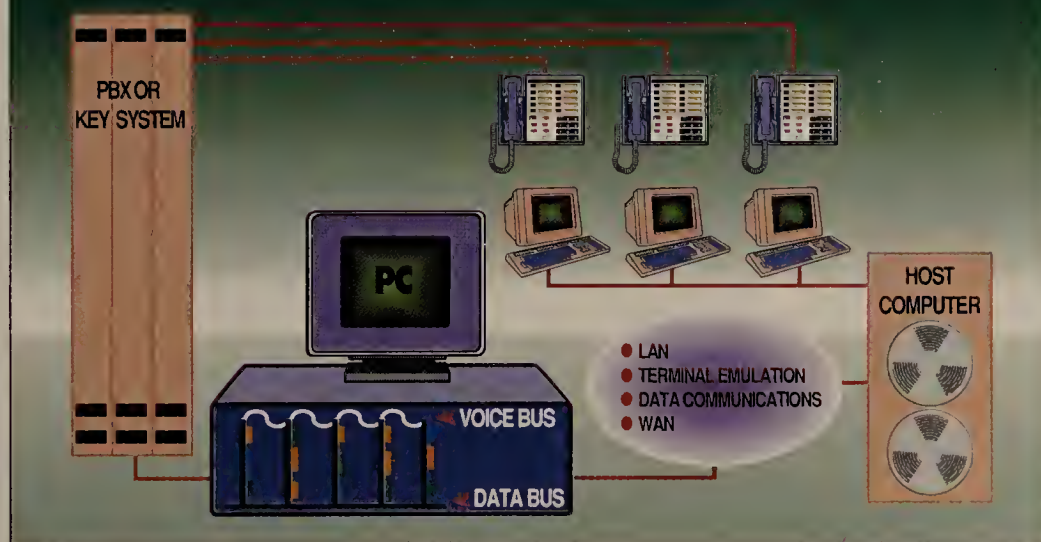
One recent idea: Emulate the proprietary electronic phone on a printed circuit card inside an IBM or clone. Let the PC do everything a human using the phone could do. But faster. More Efficiently. Attach the card to other voice and call processing cards, like voice synthesis, voice recognition, touchtone generation and recognition, etc. Virtually all switch makers—from PBX to key systems—are opening their "desktops."

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LANs are the best complements phones ever had.

Phones are great for long conversations of low bandwidth. LANs are great for short conversations of high bandwidth.

LANs are great for messaging, for faxes, and for e-mail, Phones are great for conversations.

There are more phones on desks than there are PCs on desks. There are far more phones than there are PCs on desks connnected to LANs.

The opportunity is inescapable.

WHY NOVELL TIED UP WITH AT&T

by Harry Newton
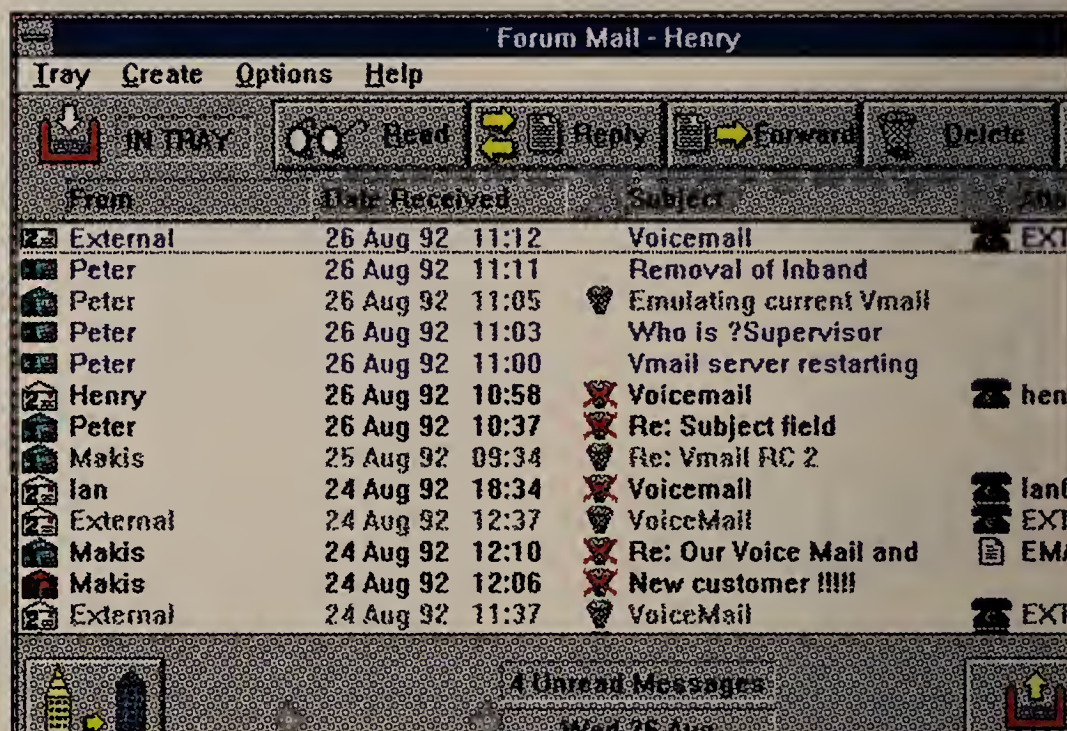
Morning. Turn on your PC. Here's your first screen. A bunch of voice mail. Some fax mail. Some e-mail. Run your mouse up to the message you want to see or hear. If it's e-mail or fax mail, it's on the screen. If it's voice mail, your phone rings and you hear it. Better yet, your screen changes to resemble a cassette recorder with buttons showing play, fast forward, rewind, etc. Much easier than "hit 1 for play," etc.

HOW AT&T USES A NOVELL LAN TO CONTROL ITS PHONES

Novell and AT&T have inked a deal to put telephony onto Novell LANs. The Telephony Server NetWare Loadable Module (NLM) is the first product. It is an AT&T PC-card sitting in the Novell file server. The card connects to the ASAI (Adjunct Switch Applications Interface) port on the AT&T Definity PBX. Anyone with a PC on the network and an AT&T phone on their desk can use telephone features, such as auto-dialing, conference calling and message management (a new term for integrating voice, fax and e-mail on your desktop PC via your LAN). The Novell/AT&T

deal intends to create open Application Programming Interfaces (APIs) that third-party developers can work with. A Novell/AT&T example of what could be developed: A user could select names from a directory on his PC. He could tell the Definity PBX through the PC over the LAN to place a conference call to those names. At the same time, a program running under NetWare would automatically send an e-mail to the people, alerting them to the conference call and giving them the

agenda. All participants would have access to both the document and the conference call simultaneously.

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7 FOR END USERS

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5. **Learn how to measure the profitability of each of your company's products** by seeing, inter alia, the cost of supporting them. Which should you re-price, fix or drop?

6. **See the NEW support "automation" tools.** Learn how to give your company's customer service people huge productivity gains and to give them an "offensive" thrust, not a "defensive" shield.

7. **Meet brand new players/developers!** Learn what's coming. Strike up new business relationships! See new technology! Try out the new software and hardware.

and 7 FOR DEVELOPERS

1. **Do deals.** This area is "hot." People with money are looking to back other people. People with ideas are looking for people with money. People with product are looking for distribution. People with distribution are looking for product.

2. **Figure which product and which manufacturer are best for you.** Some big manufacturers are ponderous. Some big ones are surprisingly agile. Which will help you the most?

3. **Check out the Developers' Toolkits.** Almost every telephone switch maker now offers a toolkit. Some work better than others. Which is best?

4. **Which of the new technologies are worth your energies?** Some are a "bust." Some will boom. Which is which?

5. **What are the best entrepreneurial opportunities** in PBX-to-host applications? In "dumb" switches? Which industries? Which applications?

6. **Which lets you get to market fastest?** An Applications Generator or an Applications Development language? Which Applications Generator? And why?

7. **Which early developers have been shot in the back?** What have they learned? Can you learn from them?

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TELECOM DEVELOPERS '93

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BellSouth Corp. last week said "the Blizzard of 1993" forced it to switch only 32 of the 1,600 switching offices in its nine-state region to backup power, with the figures ranging from zero in South Carolina to 16 in Alabama.

AT&T's fractional T-3 access pricing

The per-connection cost to the carrier's recently tariffed offerings

Access Coordination Function: The cost AT&T incurs coordinating the provisioning of access links for users with interoffice channels.

Speed (bit/sec)	Monthly	Installation charge
4.6M	$220	$610
6.2M	$288	$800
7.7M	$352	$975

Access Connection: The cost of physically connecting each local access link to an AT&T central office.

Speed (bit/sec)	Monthly	Installation charge
4.6M	$615	$885
6.2M	$800	$1,050
7.7M	$985	$1,145

Function Connection: The cost of linking each local access line to the interoffice channel of an end-to-end link.

Speed (bit/sec)	Installation charge
4.6M	$450
6.2M	$500
7.7M	$550

SOURCE: AT&T, BASKING RIDGE, N.J.

Regulatory Update

A federal district judge in Baltimore last week ruled that Jiffy Lube will have to pay in full for toll fraud that occurred at its private branch exchange in 1988.

The company lost $55,727 in one month.

In June 1988, Jiffy Lube installed a new **AT&T** PBX at its headquarters in Baltimore that had a remote access feature.

In November of that year, someone discovered the access code that would allow a caller to access the PBX and get dial tone to make calls. The hackers called in on an unpublished MCI Communications Corp. 800 number to the AT&T PBX and placed outbound calls via AT&T services to locations around the world.

Jiffy Lube contended that the access code plus the use of an unpublished 800 number was adequate security for the system. Jiffy Lube refused to pay for the calls, and AT&T filed suit.

In the ruling last week, the federal judge agreed with AT&T's contention that Jiffy Lube and all other customers are responsible for all calls placed from their premises, regardless of whether the calls were authorized.

AT&T relies on language in all of its tariffs to enforce such charges.

FCC auditors too taxed to watch for cross-subsidies

GAO finds agency unable to cope with load.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — Due to staffing shortages and an increased work load, the FCC can no longer guarantee it will police telephone carriers to make sure they do not subsidize new business ventures with money from regulated operations, according to a recent government report.

The General Accounting Office (GAO), the accounting arm of Congress, said the Federal Communications Commission now has a staff of only 14 auditors to review the books of hundreds of regulated telephone carriers. That means auditors can, at most, review the highest priority areas only once every 11 years and audit all areas once every 18 years.

Since the statute of limitations prevents the FCC from imposing fines on carriers more than five years after an illegal cross-subsidy, the agency can no longer operate as an effective policing organization, the GAO report said.

"We believe that the number of FCC auditors remains inadequate to provide a positive assurance that ratepayers are protected from cross-subsidization," the report said.

Who will pay?

Many user and consumer groups have complained that users will be the ones to pay if the FCC is unable to properly police telephone company expenditures.

Groups such as the International Communications Association and the Ad Hoc Telecommunications Users Committee have told the FCC they fear that telephone companies will be able to use money they collect from their monopoly operations to subsidize new business ventures.

If the new ventures collapse, the users said they are concerned that the telephone companies might raise rates on their regulated operations to compensate, as opposed to passing the loss on to shareholders as other companies would be forced to do.

Overburdened, understaffed

The GAO report, which was requested by Rep. Mike Synar (D-Okla.) and Rep. Edward Markey (D-Mass.), was an update of a report the GAO prepared in 1987 warning of serious auditing problems at the FCC. At that time, the FCC had 15 auditors. Since then, the auditors' work has increased by 35% while the staff level has fallen by one person.

The FCC has added new accounting safeguards in an attempt to compensate for the low level of staffing, but the GAO report concludes that those efforts have been inadequate.

For example, the FCC instituted a system of audits by outside accountants as well as a computerized monitoring system.

"Although these safeguards can give the FCC useful information for monitoring carriers' operations, they have not detected all cases of cross-subsidization," the GAO report said. **Z**

SMDS users longing for the long haul

Metropolitan SMDS gives early users a sample, but true rewards come with end-to-end service.

By Bob Wallace
Senior Editor

While they've already profited from SMDS within major metropolitan areas, early users say the service's real potential can't be tapped until it is supported across wide-area networks.

Switched Multimegabit Data Service can provide users more bandwidth at a lower cost than private-line services, as well as the ability to cost-effectively support fully meshed networks for maximum reliability. But for most customers, as long as SMDS remains limited to metropolitan service islands, its usefulness will be limited.

"The interexchange carriers have us hamstrung," said Jim McCabe, long-haul communications/data networks subsystems manager for the Numerical Aeronautical Dynamic Simulation program with the National Aeronautics and Space Administration's Ames Research Center in Moffett Field, Calif. "We'd love to use SMDS for sites throughout the state, but we need long-haul SMDS to interconnect them."

McCabe's organization was the first in the nation to participate in an interexchange SMDS field trial in which sites served by Pacific Bell and GTE Corp. were linked using AT&T-provided long-haul service. SMDS was used to support a high-bandwidth visualization application.

"The trial was a success," McCabe said. "It showed that multiple carriers can join forces and provide an end-to-end SMDS service, which was great news for users and vendors, as well as local and long-distance carriers."

But despite growing user demand for long-haul SMDS, the Big Three do not yet have anything to offer customers such as McCabe.

MCI Communications Corp. was the first long-haul carrier to announce an interexchange SMDS service, though it is not yet available.

Sprint Corp. is in the midst of a so-called SMDS-over-frame relay

Sprint rolls out Clearline in 12 additional countries

By Bob Wallace
Senior Editor

WASHINGTON, D.C. — Sprint Corp. last week said its International Clearline family of private-line services is now available to 12 new countries in Europe, the Pacific Rim, the Middle East and the Caribbean.

Sprint's International Clearline services offer dedicated all-digital links that the carrier said are less expensive than International Direct Distance Dialing connections for users with more than three to five hours of daily connect time.

International Clearline services run at 56K, 64K, 128K, 192K, 256K, 384K, 512K and 768K bit/sec, as well as 1.024M, 1.544M and 2.048M bit/sec.

The additional countries in which the Sprint services are now available are Austria, Hong Kong, Israel, Japan, Kuwait, Malaysia, Mexico, the Philippines, Puerto Rico, Singapore, South Korea and Taiwan.

Sprint uses undersea fiber cables to deliver private-line service to all the new countries except Kuwait, South Korea, Malaysia and Singapore, which are served by satellite.

Provisioning intervals for International Clearline service vary depending on the country in which the link terminates. Sprint said it can deliver the service within 60 days after receipt of order.

The services were previously available in Belgium, Bermuda, Brazil, Canada, Chile, Demark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Spain, Sweden, Switzerland and the U.K. The carrier pledged to add to its list by year end but would not name planned countries. **Z**

Regulatory Update

Victims of toll fraud argue that it is unfair for AT&T to hide behind such tariff language, and the Federal Communications Commission has a pending proceeding that examines whether liability should be spread among users, carriers and equipment manufacturers.

However, the judge last week agreed that the tariff language protects AT&T and ordered Jiffy Lube to pay all charges plus interest.

AT&T and **MCI Communications Corp.** last week clashed once again over the rules that should govern 800 portability.

The carriers have disagreed on virtually every aspect of the proceeding and last week squared off over the question of how quickly a carrier must act to move a customer's traffic to another carrier's network once a customer requests it. Currently, rules developed by an industry group say that a customer should be moved as quickly as possible.

But **Allnet Communications Corp.** told the FCC last month that those rules are inadequate and asked the commission to impose rules that would require users to be moved within 48 hours after their request.

Responding to Allnet's petition, MCI agreed that users should be moved in 48 hours. But AT&T maintained that the industry-developed rules are adequate.

Without more specific rules on the speed with which users must be moved, customers could be caught in between skirmishing carriers for some time, according to Allnet. ∎

SMDS users longing for the long haul

trial that will conclude in June, but it hasn't formally announced plans for SMDS service. AT&T, which said earlier this year that it had no plans to offer SMDS, has since clarified its position.

"We will have the Asynchronous Transfer Mode switching infrastructure we need to offer frame relay and SMDS, in part, later this year," said Jayne Fitzgerald, AT&T's manager of high-speed data communications services. "We could offer SMDS if there is user demand for it."

Fitzgerald said AT&T did not announce SMDS after the Pacific Bell-GTE trial because it needs to be able to provision, maintain, manage and troubleshoot the service on a large-scale basis.

"We learned a great deal about what it would take to engineer for SMDS," Fitzgerald said. "And we wouldn't want to begin [offering] a service until all operations and support systems are ready."

Interexchange SMDS appears to be a chicken-and-egg situation: AT&T and Sprint want to see adequate user demand for such a service before they begin to deploy it.

But according to one Bell Atlantic Corp. customer who participated in a regional Bell holding company-led SMDS demonstration at a major trade show, prospective SMDS users want long-haul service before they will commit to the offering.

"Users come by the booth and ask which long-haul carriers offer long-distance SMDS. I tell them MCI has announced plans to deliver it but others have not followed suit," said Richard Ford, enterprise engineer with Falcon Microsystems, Inc., a Landover, Md., network products vendor and staunch SMDS supporter. "They just turn and walk away."

Falcon Microsystems uses SMDS from a Siemens AG cell relay switch in a Bell Atlantic central office to move graphics from the firm's Landover site to a printing firm here. The setup has obviated the need to send designs via 9.6K bit/sec dial-up lines and couriers.

In the meantime, the fact that none of the Big Three have delivered long-haul SMDS service is costing Falcon Microsystems money. The company has established a five-node, nationwide Sprint frame relay network that supports a variety of applications, including electronic mail and local-area network interconnection. Frame relay is seen as a step toward SMDS, but it is costing more than an SMDS network in the company's view.

"Our plan is to use frame relay as an interim step toward a nationwide SMDS network," Ford said. "We believe SMDS will give us more flexibility than frame relay, but we don't know exactly when we'll reach that goal."

McCabe said his organization currently uses 56K bit/sec private lines to link sites that could easily be networked via SMDS. The private lines also cost more than long-haul SMDS links.

"We'd get more bandwidth for our buck, not to mention a reliable mesh network [with SMDS]," McCabe said. "But in the absence of interexchange SMDS, we're looking at paying more to replace our existing private lines with T-1s." ∎

ENTERPRISE APPLICATIONS

CLIENT/SERVER AND ENABLING SOFTWARE: DISTRIBUTED DATABASE, MESSAGING, GROUPWARE AND IMAGING

Store & Forward

Enterprise Solutions, Ltd. of Westlake Village, Calif., next month will start shipping a security and encryption package for its Enterprise Mail X.400 user agents.

ES/Secure, which is based on RSA Data Security, Inc.'s Cryptosystem technology, encrypts messages in Public Key Cryptography Standards Digital Envelopes. ES/Secure is priced at $200 per user.

Z-Code Software Corp. of San Rafael, Calif., has announced Z-Mail Lite for DOS, an electronic mail user agent that enables DOS and Unix E-mail users to communicate without the need for a gateway.

The product uses the Transmission Control Protocol/Internet Protocol and Simple Mail Transport Protocol for communications. Z-Mail Lite for DOS costs $235 per user.

Intersolv, Inc. of Rockville, Md., recently announced enhancements to its computer-aided software engineering *(continued on page 24)*

Windows-based document mgmt. product announced

IDI offering based on firm's BasisPlus DBMS.

By Joanne Cummings
Senior Writer

SAN FRANCISCO — Information Dimensions, Inc. (IDI) last week unveiled at the Uniforum Conference and Trade Show here a Windows document management product based on its current BasisPlus database management system.

The client/server-based product, called DocWorks, enables users to create databases and keyword indexes of compound documents, as well as seamlessly retrieve the documents both locally and from remote computers.

The client portion consists of a graphical user interface and runs on personal computers configured with Microsoft Corp. Windows for Unix or Windows for VAX/VMS.

The server portion contains the firm's BasisPlus database engine and runs on any Unix platform, including those from Sun Microsystems, Inc., Hewlett-Packard Co., Digital Equipment Corp. and IBM. The software can run over any Transmission Control Protocol/Internet Protocol or DECnet network.

Users can add a document to the database by calling it up within the DocWorks application. DocWorks supports up to 20 different word processing applications as well as major computer-aided design and manufacturing and graphics programs, enabling users to build databases of virtually any type of document, the company said.

Once the document is within DocWorks, the software automatically indexes the words contained in it and builds hypertext links to graphical information also included in the document. It then stores the index within a server- or PC-resident work group database defined by the user.

Users that want to retrieve documents can view a listing of work group databases they wish to search, such as sales and marketing, and then conduct a search using a variety of user-configura-
(continued on page 24)

Andersen wins contract to move N.C. to client/server

By Wayne Eckerson
Senior Editor

RALEIGH, N.C. — The State of North Carolina recently awarded a $1 million contract to Andersen Consulting to provide software and consulting services in an effort to migrate state agencies to client/server computing.

The state will use Andersen's Foundation for Cooperative Processing computer-aided software engineering tools to convert agency information systems, some of which are 25 years old, to a client/server architecture.

"We are rewriting agency information systems to reduce costs and help them become more responsive to customers," said Tom Runkle, deputy state controller for information resource management here.

Applications targeted include driver licensing, accounting and vehicle registration.

Andersen has already begun pilot projects in the state's Department of Transportation to automate the management of North Carolina's road maintenance program, which tracks all repairs, estimates and payments.

The new client/server road maintenance system will consist of 140 workstations running a construction management application built using Andersen's Foundation tools. Workstation users will be able to access and update data stored in a central mainframe and download host data into Microsoft Corp. Excel spreadsheets or Word word processing programs.

The firm is also using Foundation to replace the front end of North Carolina's statewide minicomputer-based accounting system. The system will link workstations via local-area networks in more than 40 state agencies, some of which process 100,000 transactions per month. **Z**

What is your fastest growing electronic mail system?

Lotus Development Corp. cc:Mail	32%
Microsoft Corp. Microsoft Mail	20%
IBM Professional Office System	14%
Digital Equipment Corp. All-in-1	4%
Other	30%
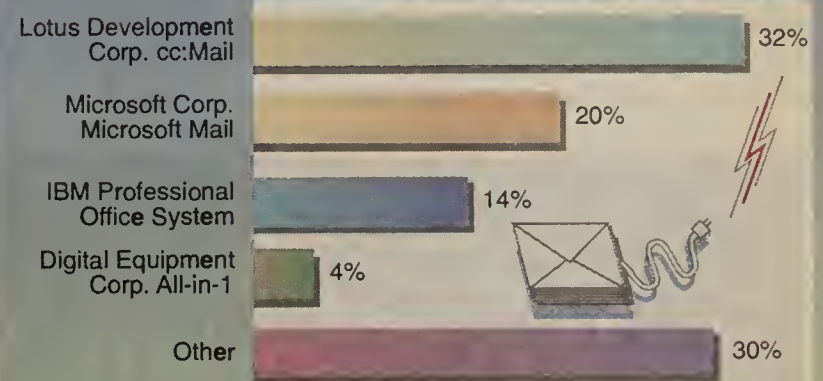
Figures are based on a survey of 50 large companies.

GRAPHIC BY TERRI MITCHELL   SOURCE: FORRESTER RESEARCH, INC., CAMBRIDGE, MASS.

Is host-based E-mail a 'road to nowhere?'

Study concludes benefits of LAN-based E-mail systems abound, with drawbacks taken in stride.

By Bob Brown
Senior Editor

Users are finding that the benefits of switching to LAN-based electronic mail systems far outweigh the drawbacks of leaving their host-based E-mail behind.

The benefits of local-area network-based E-mail systems are many, and they are mounting given the emergence of mail-enabled applications. For example, they generally feature familiar graphical user interfaces, such as Microsoft Corp. Windows, and boast a lower per-user software license fee than host-based E-mail systems.

The drawbacks include a lack of features that are taken for granted with host-based E-mail systems, such as calendaring and centralized administration.

Nevertheless, users and analysts said the time is right for wide-scale implementations.

"Applications, files and data are moving to LANs," according to "The Case for LAN E-Mail," a new study from Forrester Research, Inc., a Cambridge, Mass., market research firm. "As this happens, keeping mail on the host is like maintaining a road to nowhere."

E-mail managers are being pushed from many directions to pursue an aggressive migration from host-based E-mail systems to LAN-based E-mail, according to Forrester.

E-mail vendors have made LAN-based products attractive by keeping prices low, and some of the large companies that play in the market, such as Microsoft and Novell, Inc., promise to lower prices even more by bundling messaging with their network operating systems.

Meanwhile, end users are demanding LAN-based E-mail because they want the Windows support common on LAN-based E-mail packages. Also, LAN-based E-mail is better designed than host-based E-mail to handle emerging mail-enabled applications, such as work flow and groupware products.

Martin Franke, E-mail administrator for The Wyatt Co., an employee benefits and compensation firm in Washington, D.C., said several offices within his company are moving or looking to move from Digital Equipment Corp. VAX-based All-in-1 E-mail systems to Lotus Development Corp. cc:Mail.

One office is scrapping its VAX and moving to Novell LANs for cost reasons and, as a result, is moving 200 users to cc:Mail, Franke said. Other E-mail users in the company find the All-in-1 user interface too clunky and are asking for cc:Mail instead, he added.

"I really haven't found any drawbacks to going with LAN-based E-mail," Franke said.

Russ Chung, advisory system engineer for BankAmerica Systems Engineering, the Los Angeles technology division of Bank-
(continued on page 24)

Is host-based E-mail a 'road to nowhere?'

continued from page 23

America Corp., said LAN- and host-based E-mail systems each have their strengths. Chung is overseeing the integration of E-mail systems at BankAmerica and Security Pacific Corp., which merged last year. End users are being given a choice of using host- or LAN-based E-mail systems.

Chung said he has a sense that LAN-based E-mail systems are more popular for new installations because they are easier to use and provide a better application development environment than host-based systems. However, LAN-based E-mail system vendors are only now addressing the calendaring and directory synchronization features common among host-based E-mail systems, he said.

Bill Klauk, manager of communications operations at Continental Grain Co., a New York-based agribusiness organization, said his company has been a user of Banyan Systems, Inc.'s VINES-based E-mail product for several years. Having E-mail tightly integrated with a LAN operating system is beneficial, for the most part, he said. Dialing into the office for messages is easy, for example, because users need only to dial into a VINES server and not into "any crazy remote programs," he said.

On the other hand, E-mail systems tied to a particular vendor's LAN operating system can be restrictive, Klauk said.

The company has evaluated Beyond, Inc.'s BeyondMail product but has delayed purchasing it because of a lack of integration with VINES, which Klauk said he expects will be addressed in a future version of VINES. **Z**

You Can Put Away Your Toys

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Document mgmt. product announced

continued from page 23

ble criteria such as key words, author and date. DocWorks then provides the user with a listing of matching documents, no matter where they reside on the network.

When users choose a document to view, they click on the document name and the application that the document originated in is automatically launched, enabling them to view and edit it in its native format.

Graphics are depicted by icons in the document. When a user clicks on an icon, the graphics program is launched, enabling the user to view the graphic, as well. The software also contains security mechanisms enabling users to define whether others can edit or just view documents within a work group database.

In addition, DocWorks includes features that help save bandwidth.

"It delivers only the page or two surrounding the area that matched the search criteria," said Michael Lacey, product marketing manager at the firm. "The whole document is delivered only if the user requests it." This makes it easier to sift through available documents, he said.

Available May 1, DocWorks costs $39,000 for a 20-user license, and additional user licenses cost $299 each. For users that already have BasisPlus, DocWorks costs just $9,000 for a 20-user license. **Z**

Store & Forward

continued from page 23

(CASE) and software management tools.

The firm's Excelerator II for OS/2 CASE tools has been integrated with James Martin & Co.'s Information Engineering Methodology. Its APS CASE tool now generates Windows as well as OS/2 client/server applications. Its PVCS Software Configuration Management tool now runs on Hewlett-Packard Co.'s HP 9000 Reduced Instruction Set Computing platform and works with HP's SoftBench tools environment.

Finally, Intersolv's LAN Repository runs on Sybase, Inc. SQL Server databases running on AIX machines. All product enhancements will be available in the second quarter.

Retix of Santa Monica, Calif., announced an X.400 gateway that works with CE Software, Inc.'s QuickMail electronic mail software for Apple Computer, Inc. Macintosh computers. The gateway, which can run on the same machine as QuickMail client and server software, works with Retix's OpenServer 400 message switch. The gateway is available now for $1,795.

Soft-Switch, Inc. of Wayne, Pa., announced several enhancements to its Unix-based Enterprise Mail Exchange (EMX) message switch. The EMX will support X.400 over Transmission Control Protocol/Internet Protocol using the Internet Society's Request For Comment 1006 specification.

The switch also supports international language sets, and its client/server application program interface (API), the Soft-Switch Network API, now supports TCP/IP. **Z**

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS, ALLIANCES AND FINANCIALS

People & Positions

Windata, Inc. announced that **Michael Quarella,** formerly senior director of manufacturing operations at Racal-Datacom, Inc., has joined the Northborough, Mass.-based wireless local-area network company as vice president of manufacturing. He will lead an effort to reduce product cycle times for the FreePort Wireless LAN System so the firm can fulfill high-volume projections while maintaining quality standards.

In a reorganization of its U.S. Group organizational structure, **NCR Corp.** has appointed **Raymond Carlin,** formerly NCR vice president of retail systems, to serve as vice president of the newly created Worldwide Industry Marketing Division.

Carlin will oversee marketing and sales to key industry segments.

Digital Equipment Corp. announced that **Robert Supnik,** currently vice president and technical director of engineering, has been given the additional title of senior corporate consulting engineer to honor his technical contributions in DEC's Alpha APX program. **Z**

Carving out a profitable niche

Revenue in millions of dollars

1988	1989	1990	1991	1992
$113.0	$135.4	$158.9	$183.3	$209.6

Communications services management companies have enjoyed steady revenue growth over the past 5 years and now serve more than 28,000 business customers.

The 3 largest communications services management companies:

- Fairchild Communications Services Co. — 33%
- RealCom Office Communications, Inc. — 15%
- Shared Technologies, Inc. — 11%
- Other — 41%
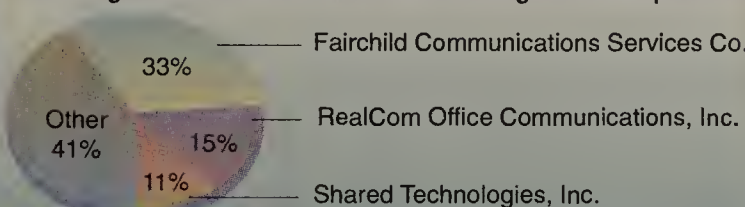
GRAPHIC BY TERRI MITCHELL

SOURCE: NORTH AMERICAN TELECOMMUNICATIONS ASSOCIATION, WASHINGTON, D.C.

Communications mgmt. providers establish foothold

Resellers of net services enjoy steady growth.

By Ellen Messmer
Senior Correspondent

WASHINGTON, D.C. — The communications services management industry saw healthy growth in 1992, with revenues increasing 14% to $209.6 million, according to a recent report.

The North American Telecommunications Association (NATA)

> **P**roviders are now established in over 500 buildings at more than 400 sites nationwide.
>
> ▲▲▲

report shows that this unique brand of outsourcing at business sites has carved out a real niche in the larger networking arena.

Communications services management providers are value-added resellers of net services to users within a building. They are now established in over 500 buildings at more than 400 sites nationwide where they manage voice and data lines, as well as billing, at each tenant's request.

According to the NATA report, three communications services management providers — Fairchild Communications Services

Co. in Chantilly, Va., RealCom Office Communications, Inc. in Atlanta and Shared Technologies, Inc. in Wethersfield, Ct. — lead the pack of about 15 such providers nationwide.

Communications services management providers offer a variety of services in the buildings they serve, including inside wiring, local, long-distance and calling cards services, voice mail, billing reports and equipment rental. The NATA report shows they lag in offering services in some areas, such as audioconferencing and videoconferencing.

These providers typically lease local and long-distance telecommunications lines to a building, including adding redundant lines for backup and disaster recovery. The report says the industry maintains service for at least 202,564 business and residential lines, with 93% of the lines serving business customers. The average business customer uses 13.7 lines.

The report says more than half of the business users are concentrated in two industry categories: Business and legal services accounts for 65,659 lines, and finance/insurance uses 18,233.

"[Communications services management] prospers in industries that tend to have companies located in multitenant buildings," the report states.

Users voice concerns about DCE products

Current offerings based on OSF's distributed technology are not certified for interoperability.

By Jim Duffy
Senior Editor

CAMBRIDGE, Mass. — Users have no guarantee that current products based on the Open Software Foundation, Inc.'s (OSF) Distributed Computing Environment (DCE) will work together in a multivendor enviroment because available DCE offerings have not been independently tested and certified for interoperability.

Although the OSF opened an interoperability certification laboratory at its facilities here last month, there are DCE products already on the market that have not been certified by the OSF or any other open standards organization for multivendor interoperability. Lack of certified interoperability poses a risk to users looking to standardize on the OSF technology to support distributed computing.

"If you buy DCE as an overall glue, you're asking for trouble," said Dick Boyle, program director for local-area communications at Gartner Group, Inc. in

Stamford, Conn.

The only assurance users have that existing DCE products will interoperate in a multivendor environment is the word of their vendors.

"They can go on faith in the vendor, faith in the [OSF] and faith in the technology itself," said Dottie Mamos, DCE marketing program manager for Digital Equipment Corp., which is shipping two DCE products, one of which has been on the market for almost a year.

For some users, that is not enough. "That's unacceptable," said a principal communications consultant at a large Minneapolis-based financial services firm who requested anonymity. "For people to have confidence in DCE, vendors have to follow the specification and [test with a] third party that can certify that you're interoperable."

Murray Laidley, strategic unit business manager at Haliburton Co. in Kirkland, Wash., shares the Minneapolis user's concern. Due

INDUSTRY BRIEFS

David goes public. David Systems, Inc., the Sunnyvale, Calif., manufacturer of hubs and local-area network products, announced its first public stock offering of 2.5 million shares, which are expected to sell for about $7 per share. The firm will use the capital to repay debt and invest in sales and marketing.

MFS goes public, too. MFS Communications, Inc., the Omaha, Neb.-based alternative service provider, announced that it will launch its initial public stock offering of 8.5 million shares this April, with the net proceeds to cover costs related to the expansion of its network services.

Canada, U.S. join LANs. ANS CO+RE Systems, Inc., the commercial subsidary of Internet backbone provider Advanced Network & Services, Inc., will connect its network to Fonorola, a Canadian provider of network services, to support LAN-to-LAN interconnection. Fonorola also said it will offer the ANS CO+RE InterLock security services, including encryption.

Centel changes to Sprint. Centel Cellular Co. will change its name to Sprint Cellular Co., effective April 21, to reflect the completion of the merger between the Centel company and Sprint Corp. Although Sprint is based in Kansas City, Kan., Sprint Cellular will keep its headquarters in Chicago. **Z**

Users voice concerns about DCE products

continued from page 25

to the recent lack of an industry-sanctioned, vendor-neutral certification program, Halliburton has had to set up its own lab at company facilities to test DCE products for interoperability.

The lab has been in place for six months. But Laidley said he has better things to do than run trials of vendors' DCE products. "It's something we wish someone would take on," he said.

An OSF spokeswoman acknowledged that there are DCE products on the market that have not been certified as interoperable. She said those products can be tested and certified at the new OSF lab, but it is up to the vendors to bring them in.

"If certification is an important by-product of [vendors] shipping code and an important message to their end-user population, then it behooves them to go through certification," the spokeswoman said. "It's not up to OSF to force certification on anyone."

DEC started shipping a DCE starter kit for Ultrix and OSF/1 in May 1992, and a DCE developers' kit for OpenVMS this past February. Applications built with the tool kits should interoperate with other vendors' DCE applications since they support the same DCE remote procedure call (RPC), Mamos said.

"The RPC is the engine [of DCE]," she said. "If we write to the same RPC, there's no forseeable [reason] why there would be a glitch."

Katherine Jones, DCE product manager at Data General Corp., which will ship DCE products on its AViiON systems in July, said OSF offers a reference port of the DCE on an IBM AIX RISC System/6000 platform against which vendors can test for interoperability.

"According to OSF, if it works against IBM, it will work against others," Jones said. "It's not a guarantee; a guarantee for a customer is if a vendor supports interoperability and there's a quirk, it'll be fixed."

Users worried about such quirks should rest assured that vendors are sticking very close to OSF DCE source code, said Lee Atkinson, a staff programmer at IBM. IBM started shipping DCE on its AIX platforms in January, and an OS/2 version is scheduled for the second quarter, he said.

Writing to the same source code is "not enough by itself to convince users," said Harold Hauck, a consultant at Open Systems Computer Consulting in Corte Madera, Calif. "They'll have to see [interoperability]."

The Challenge

Users may have that chance very soon. The OSF will sponsor a public gathering in Boston this spring to stage DCE interoperability.

The event, called Challenge '93, is intended to display the portability and interoperability of multivendor DCE implementations across multivendor platforms.

To qualify for Challenge '93, vendors have to test their DCE products, old and new, for multivendor interoperability at the new certification lab in April. The certification lab, called OSF Interoperability Lab (ILAB), is intended to replicate a multivendor end-user environment for "reality-based" interoperability testing and verification.

ILAB offers 11 machines representing six hardware architectures and seven operating systems from leading vendors and can also host a maximum of 20 platforms on-site for testing at one time.

Analysts say it's about time for ILAB and Challenge '93. "The worst thing possible for OSF now is for users to start saying DCE doesn't work together," said John McConnell, vice president of Infonetics Research, Inc. in Boulder, Colo. ⧫

Mgmt. providers establish foothold

continued from page 25

Within the buildings they serve, communications services management providers attain a 45% penetration rate in terms of the square footage occupied by the tenants. NATA's survey of customer contracts reveals a wide diversity of arrangements, ranging from month-to-month deals to 10-year agreements.

Also, the report notes that as this niche of facilities management grew over the past five years (see graphic, page 25), acquisitions and mergers have changed the shape of the communications services management industry.

Fairchild Communications has purchased five companies since 1989, including Telemedia Associates, Inc. and Teletech Resources, Inc. in 1992. Shared Technologies, RealCom Office Communications and ShareCom-Austin, L.P. also acquired other communications services management providers and sites during the past three years. ⧫

MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USER GROUPS AND ASSOCIATIONS

Worth Noting

"When there is no business plan in place, the network plan is reduced to mumbo jumbo. You can't make specific recommendations because a recommendation would imply that you know what you are doing, which you don't."

Thomas Nolle
President
CIMI Corp.
Vorhees, N.J.

Manager Minutes

EDI in health care. The Healthcare Informatics Telecom Network (HITN) is scheduled to broadcast a two-part program examining the impact of electronic data interchange on the U.S. health care industry.

Scheduled for April 29 and May 14 from 12 p.m. to 2 p.m., the program will look at such topics as the anticipated benefits of EDI and EDI connectivity issues, as well as case studies of successful health care EDI projects currently under way across the country.

The HITN program is intended to offer information about how users can implement and use EDI effectively. There is no charge to receive HITN programming, and subscribers of Healthcare Satellite Broadcasting, Health & Science Television Network and Medivision can receive the program through those services.

Others can register for the program directly through HITN by calling (914) 265-2322. **Z**

Reengineering not up to snuff

Despite the increased popularity of business reengineering, CIOs have found that the benefits of such projects often fall short of expectations.

Figures are based on a survey of 500 chief information officers.

GRAPHIC BY SUSAN J. CHAMPENY   SOURCE: DELOITTE & TOUCHE, CHICAGO
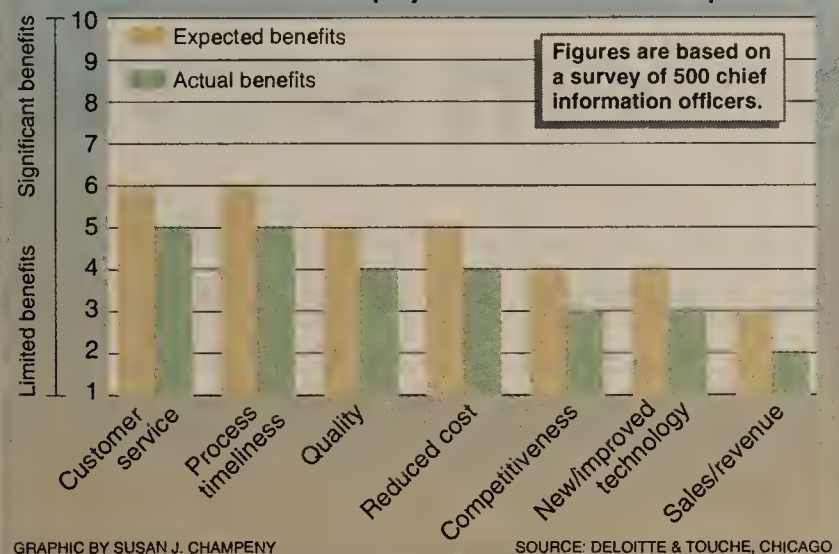
Reengineering falls short of expectations, study finds

CIOs surveyed also forecast bleak '93 budgets.

By Joanne Cummings
Senior Writer

CHICAGO — Although many firms have implemented a variety of reengineering programs over the past year, few have reaped the benefits they expected, according to a study released last week.

The fifth annual Deloitte & Touche "Leading Trends in Information Services" study was based on a survey of 500 chief information officers (CIO). In addition to the findings on reengineering, the study says information services (IS) budgets will not keep pace with inflation this year, and only the most and least profitable firms will increase spending in 1993.

According to the study, the average number of reengineering projects per respondent has increased 175%, from 1.6 in 1991 to 4.4 last year. The projects cover such areas as customer service, systems development, and accounting and finance.

But many CIOs have found that the actual benefits have fallen short of expectations (see graphic, this page). The highest realized benefits are for improved customer service, faster processes and increased quality, while the lowest are for increasing sales and revenue.

The study also found that the most profitable companies generally received the greatest reengineering benefits, whereas less profitable companies seldom realized their expectations.

In addition, the budget outlook for 1993 is fairly bleak, the survey found. With inflation running at about 2.9%, the CIOs surveyed said they plan to increase their IS budgets by just 1%.

Only the most and least profitable firms expect to increase IS spending next year, while those reporting the most moderate profits predicted flat budget growth. According to Deloitte & Touche, this is because the profitable firms are pleased with the results of their IS investments and are willing to invest more, whereas the less profitable firms may be hoping to increase profitability by investing more heavily in IS.

For a free copy of the study, contact Deloitte & Touche at (312) 946-3433. **Z**

MANAGING TECHNOLOGY
BY DAVID FERRIS

Setting up an Internet connection

Through Ed Krol's monthly columns, readers are becoming more familiar with the Internet ("Conducting searches on the Internet," NW, March 15). This week, David Ferris discusses who should use the Internet and explores some usage issues.

The Internet is a lot like the phone system in that nobody owns it. The participants have merely agreed to a standard way to share resources. With a little simplification, the standard is Transmission Control Protocol/Internet Protocol.

The main functions you receive over the Internet are electronic mail, access to bulletin boards and forums, the ability to browse remote directories, terminal emulation and mail-based file transfer.

Reading the trade press, you sometimes get the impression that Internet use is common in the business world. It's not. For every computer user who connects to the Internet, there must be at least 30 who don't. And among those one-in-30, perhaps 75% use it only for E-mail.

But there are people who can really profit from Internet access, including computer and network staff, research and development and engineering personnel, as well as sales and support staff.

So suppose you want to implement an Internet connection; what are the main problems you're likely to face?

■ **Acceptable use policy.** Certain government-funded parts of the Internet prohibit for-profit use. Companies worry about this, at least when they plan their Internet connections, but they shouldn't. A good way around it is to connect via a commercial Internet service provider — an emerging class of common carrier.

There is no for-profit prohibition on the parts of the Internet run by commercial service providers, and you're not responsible if your packets happen to be routed over a restricted portion. Call the National Science Foundation at (617) 873-3400 for a provider list.

■ **Staff training.** Most computer people don't understand TCP/IP, and learning what you need to know is a lot harder than mastering Lotus 1-2-3 macros. Managers should determine if they have any TCP/IP skills in-house. R&D and engineering departments are good places to look.

■ **Mail.** Internet mail messages can sometimes take a very long time to arrive — five days, for example — or they can simply disappear. There isn't a full solution here, but the problem is reduced if E-mail administrators allocate proper time for management and training.

■ **Reliability.** When using the Internet, you have no way of knowing what path your packets will take. Some of the hops may be over informally organized subnetworks, which can be turned on or off at the discretion of local management. You can improve things by using commercial providers. They have redundant data

Remember how you felt last time you tried to get your phone system serviced?

You get bounced from service provider to vendor to service provider. From this region to that region and then back again.

It's enough to give you whiplash.

That's why at ROLM, we put a completely different spin on customer service. We provide service for our customers from a single source.

Which means you have one number to dial. And one person to contact — the person who can actually do something about getting your phone system serviced.

Of course, considering ROLM's unsurpassed reputation for reliability, that person is likely to remain something of a stranger. In fact, our customers awarded us the highest overall ratings in the last three Customer Satisfaction Surveys conducted by Dataquest, a leading independent research firm. With top ratings in both hardware reliability and system performance.

Also, in most cases we can diagnose and repair system glitches from a remote location. Usually before you even notice anything is wrong.

But in the event that you actually need to call us in, we send you a

Vendor equipment warranties don't hold water

Computer and communications vendors have a responsibility to ensure that their equipment works properly in the environment for which it is designed to be used. When people buy a new car, they expect it to stop when the brakes are used, even during a rainstorm. Why, then, do we accept less from our new communications and computer equipment?

Look at most warranties and service contracts for telecommunications equipment. Read the fine print. So-called acts of God or acts of nature are not covered. This means that if there's a storm and lightning hits near your building, your expensive electronic equipment is not guaranteed to work. And many times, it doesn't.

Even though there isn't any smoke, fire or sign of damage, it's dead. The repair technician, however, says the problem is due to "lightning damage" and hands you a bill for thousands of dollars. And it's up to you, the user, to prove that the problem wasn't caused by lightning damage.

One day last summer, for example, the typical late-afternoon thunderstorms blew through our northern Florida community. Within minutes, calls came in — via two-way radio — from two of our nine locations saying that telephones were out. Service technicians were called and, not surprisingly, they blamed it on lightning damage. The bill was just under $30,000. Two weeks later, during another storm, they made the same claim, and some of the same parts needed replacing.

Isn't it time we demanded from our suppliers the same level of quality and service we expect from our automobile manufacturers?

Cars are expected to run efficiently and safely in much more severe conditions than most communications and computer equipment. Sure, we can buy additional surge suppressors, power filters and the like in an attempt to protect our equipment, but do we have to buy a special shield to go over our new car just so we can operate it in the rain? Of course not.

We expect the manufacturer to do what is necessary to protect the critical parts of our car from the elements it is likely to encounter during normal operation. The same should be true of our communications equipment.

It will cost too much! We can't protect against the unknown! This is what we hear from our computer and communications equipment manufacturers. But come, now. A $5 suppressor circuit in a $50,000 piece of equipment? An extra regulating transformer? Proper grounding during installation? These are not big-ticket items, but they may save big bucks in the long run.

Who knows better than the manufacturer the intended use of their equipment? They spend thousands of dollars in advertising telling you how great their equipment is and why you should use it. So why don't they guarantee it will work in the environment where it's going to be used?

But then again, if they make it that good, their service technicians may go the way of the Maytag repairman. ▣

Lewis is the telecommunications manager at Jacksonville Electric Authority in Jacksonville, Fla.

EDITORIAL

AT&T would be wise to rethink its 'fresh look' tactics

Tariff 12 users are among AT&T's biggest, most loyal customers, so it's surprising that AT&T appears to have adopted a scare tactic to warn them from switching carriers when 800 portability becomes a reality.

That's exactly what rivals and some customers are accusing AT&T of doing by threatening to hike rates dramatically for Tariff 12 customers that decide to switch during the Federal Communications Commission-mandated "fresh look" period.

During this time, which extends from May 1 — when 800 portability is scheduled to commence — to Aug. 1, Tariff 12 customers will have the option to terminate their custom net deals with AT&T to take advantage of new competition in the 800 services marketplace.

But AT&T claims that once a customer decides to switch, its Tariff 12 contract is void and the user will pay higher rates on a monthly tariff while it shifts traffic to the rival carrier. AT&T says users won't be able to meet term and volume commitments.

Members of the Custom Network Service Users Group — an association of Tariff 12 users — who have seen a draft of the monthly tariff, say users could pay as much as 70% more than current rates. The group said that subjecting users to higher rates for the six months or more it can take to switch carriers "is likely to render fresh look a nullity."

We have to agree. AT&T's message seems clear: Jump ship and you'll pay the price.

The FCC has said AT&T won't be able to charge higher rates during this period. But what happens to users still in the process of switching carriers after Aug. 1 is unclear. Before allowing any monthly tariff to take effect, the FCC has to ensure it isn't punitive in nature and that pricing accurately reflects the change in a user's relationship with AT&T.

For its part, AT&T should rethink this strategy. Current customers won't appreciate what seems like a veiled threat, and prospective buyers aren't likely to take a positive view either. AT&T may lose some customers during "fresh look," but if it ever hopes to win them back, it needs to be careful now. ▣

DISTRIBUTED COMPUTING
BY JOHN R. RYMER

Standards dream will die unless process is retooled

Recent conversations with users have left me discouraged about the prospects for vendor-independent standards in distributed computing. Despite increasing vendor efforts to produce vendor-neutral standards — those not owned or controlled by any one vendor — users are increasingly turning away from these standards as the basis of their corporate architectures. This is because most vendor-neutral standards are merely the standards that vendors were able to agree on, not the standards that users need.

As a result, the dream of creating a useful suite of vendor-neutral standards has begun to die. Our only chance of resuscitating the dream is to completely retool the methods used to create standards.

As user organizations move to distributed environments involving products from a variety of vendors, standards have never been more important. Between 1988 and 1990, we saw not only the rise of X/Open Company, Ltd. as a potential standards clearinghouse, but also the birth of consortia seeking to drive standards in advanced technologies, such as distributed object management — by the Object Management Group — and enterprise distributed computing environments — by Open Software Foundation, Inc. (OSF).

Many expected this trend to fuel a broad effort to define vendor-neutral standards. It appeared at one time that users, the primary beneficiaries of these standards, would be in the driver's seat.

But this prediction hasn't come to pass. Most vendors have continued to seek proprietary advantage in the market using their own "standards." And users have been unable to find the consensus, funding or mechanisms to take control of standards definition.

Open standards creation is failing for two reasons. The first is the lack of architectural context in most recent standards. It is never clear how each new standard fits into an overall network architecture or how different standards work together.

> **Most vendors seek proprietary advantage using their own "standards."**
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> ▲▲▲

The second is lack of follow-through to ensure that different standard implementations work together.

An example of vendors creating standards without regard to context is the Desktop Management Task Force (DMTF), an ad hoc group of vendors that banded together last year to create an application program interface (API) to management services. DMTF's goals did not include defining how its API relates to broader efforts within in the International Standards Organization, X/Open, OSF and other organizations to define management services and APIs. It should have.

Without context, users seeking to define comprehensive architectures are left to figure out how new "standards" such as the DMTF API fit in. This makes defining a vendor-neutral architecture too risky and too time-consuming for many users.

On the issue of follow-through, the industry has gone from the sublime to the ridiculous in the way it creates standards. Creating a standard once meant employing the carefully considered procedure used by the ISO, the Institute of Electrical and Electronics Engineers, Inc. and similar organizations. Standards creation was primarily an exercise in engineering.

The most recent standards activities reject the de jure approach as being too slow. The popular approach is for an ad hoc group of vendors to define an API, then offer it as a standard. These efforts don't address how to make implementations of the API compatible.

What's needed from the many ad hoc efforts is more work: Define what it means to be compatible with the API, build a reference implementation, and design compatibility tests and procedures. Without these steps, APIs are hollow standards; different implementations won't be guaranteed to work together.

Until these two issues are addressed, most users will flock to the vendors' "standards" and not to vendor-neutral standards. Why? The vendor standards may not be open, but they have an architectural context and generally promote compatible implementations. These vendor-owned standards will also be the death of the open systems dream. ⓩ

Rymer is the editor of "Distributed Computing Monitor," a monthly report published by the Patricia Seybold Group, Inc. in Boston. He is also chairman of the Patricia Seybold Marathon Week Conference, to be held April 19-23 in Boston. For information, call (617) 742-5200.

TELETOONS
BY FRANK AND TROISE

The Network Manager's Handbook
RULE 24
How to tell if there are bugs in your Group Scheduling Software.

Bil Frank

LETTERS

Virus protection

Michel Kabay's opinion column, "Viruses should not be protected by First Amendment" (*NW,* March 1), lacked convincing justification to make publishing virus code illegal. Kabay's contention that First Amendment rights do not apply to virus code focuses on free speech. However, there are other rights in the First Amendment that come into play.

Potentially harmful expressions that enjoy First Amendment protection are too numerous to ignore. For instance, there is abundant literature about how to make a bomb. Bombs are potentially harmful. There are legitimate reasons for making bombs just as there are legitimate reasons for studying virus code. Can we make publishing information about how to make a bomb illegal? In general, the answer is no. In fact, the courts have upheld *Progressive Magazine's* First Amendment right to publish detailed information about making an atomic bomb.

Kabay's point that virus code is not speech but mere "programs" was a contradictory addition to an article that devoted most of its effort to analyzing why all speech is not protected by the Constitution. The copyright vs. patent argument he raised is an old one.

The courts agree with Kabay's point that "a program is a set of instructions." Whereas Kabay uses this illustration to categorize programs as patentable inventions that don't equate to literal speech, some courts have used the same argument to exclude some programs from patent protection, claiming their inherently algorithmic nature makes them uninventive enough to warrant a patent.

Presumably, whether assumed to be protected by copyright or patent, the authors of

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Not just X.25 anymore

As VANs and IVANs offer more sophisticated services, the selection process gets more difficult.

Value-added networks (VAN) are getting quite sophisticated these days, offering users a wide array of application processing services and international links, in addition to the low-cost X.25 data transport services that have been their hallmark for years.

VAN selection has become more difficult as a result of suppliers offering such applications as electronic data interchange and electronic mail, as well as extending their networks' geographic reach to many of the world's up-and-coming economic regions, from Russia to the Asia-Pacific area.

Many firms are finding it easier to purchase VAN transport, applications and management services than to set up and run equivalent services themselves.

But making a purchase in this market can be tricky. There are currently about a dozen significant VAN providers, some of which also count as international VANs (IVAN). These VANs and IVANs offer widely varying pricing schemes as well as the ability to mix and match access methods and transport speeds, making true comparision between providers difficult.

Despite the maddening array of options, large customers can obtain customized pricing and access plans in exchange for signing long-term contracts.

❖ ❖ ❖

X.25 remains the most common backbone protocol for VANs because of its ability to correct the errors introduced by imperfect foreign telecommunications facilities and its worldwide support. Although X.25 is slower than frame relay and other possible protocols, it remains fast enough for most users' needs.

❖ ❖ ❖

Key factors in selecting a domestic VAN include evaluating the number of points of presence (POP), which will have a bearing on the cost of dedicated local-loop access. The range of access interfaces, speeds and methods supported are also important, as are the operation and maintenance of those access links.

One factor that could set some VANs apart from others is support for wireless access from both cellular telephones and packet-switched radios. There are early wireless access services on the market now, and others are in the testing stage.

Users in the market for application services need to evaluate the level of integration among VAN applications, the level of service and support, and the quality of the carrier's application compared to what users could put together on their own.

In addition to considering the same factors that go into selecting a domestic VAN, users looking for IVAN service need to find a provider with links to the right parts of the world. While the major carriers generally provide connectivity to major business centers, such as Europe and Japan, some carriers specialize in certain other regions.

The IVAN market is flourishing for the same reason it always has: X.25's ability to provide a reasonably priced, reliable data stream over error-prone circuits to geographically dispersed regions of the globe. IVANs are quickly adding switching nodes in foreign countries, a move that gives them greater control over service provision than using nodes owned by other carriers.

IVANs are also providing the kind of layered applications available domestically on a global scale, as well as comprehensive service and support packages, which many firms see as a prerequisite to trusting a provider with control over their mission-critical applications.

Scoping out VANs

A handful of VANs offer a service portfolio diverse enough to put them in the high end of the market. Those VANs typically offer a large

The Short List

Domestic:
☑ AT&T's EasyLink Services
☑ CompuServe, Inc.'s Packet Services
☑ GEIS' GE Information Services

International:
☑ BT's Global Network Services
☑ Sprint Corp.'s SprintNet

Complete details about The Short List appear on page 40.

number of high-end applications running over a comprehensive transport facility with wide geographic reach. In addition, these VANs often bundle applications in custom packages. Common applications include EDI, proprietary and standards-based E-mail, database access, transaction processing and store-and-forward facsimile capabilities.

Mid-range VANs offer basic transport services bundled with support for a single application, such as EDI. At the low end are the basic X.25 transport

providers.

High-end IVANs offer full outsourcing of connectivity and applications management for global networking. High-end providers typically own nodes in some of the countries they reach but may rely on foreign carrier nodes in others. In some cases, IVANs rely on an X.75 gateway between their backbone X.25 network and that of a foreign carrier.

The best IVAN providers are also able to dispatch service personnel to customer sites in any county in order to repair equipment or maintain applications. Some IVANs are now offering service-level agreements in which they pay a penalty when they fail to provide a specified level of service.

Middle market IVANs service fewer countries or offer fewer applications, while low-end IVANs specialize in reaching certain countries.

Plugging into the network

While many customers are turning to VANs to provide fully managed applications and connectivity, the first step in evaluating a domestic service is finding out how easy it is to connect terminals and hosts to the VAN over dedicated or dial-up links.

Because Sprint Corp. and Cable & Wireless Communications, Inc. are both VANs and interexchange carriers, they have more dedicated access points than VAN-only providers. MCI Communications Corp. does not provide dedicated access to its VAN services, opting instead to offer dial-up-only access. AT&T provides its VAN services through a packet network that is separate and smaller than its long-haul voice network.

Sprint and Cable & Wireless allow customers with dedicated VAN access to

By DANIEL BRIERE and CHRISTOPHER FINN

Value-added networks

Company	Service family	Domestic POPs	Foreign Nodes	Countries reached by X.75	H=Host T=Terminal	300	1,200	2,400	9.6K	14.4K	19.2K	56K	Other	Protocols supported (A=Asynch B=BSC S=SNA T=TCP/IP X=X.25)	Network management (C=CMIP R=Reports S=SNMP T=Terminal)	E-mail	X.400	X.500	EDI	Transaction processing	Database retrieval	Managed network service	Router network service	Pricing (F=Fixed/U=Usage)	Pricing (C=Connect/V=Volume)
Advantis (708) 240-3000	Advantis	276	384	90	T		A	A	A,C	C	B,C	B,C		A,B,S,T,X	R,S	✔	✔		✔	✔	✔	✔	✔	F: $750-$4,800	C: $4.45-$55; V:✔
					H				C	C	C	C	✔											
AT&T (800) 242-6005	EasyLink Services	167		115	T	A	A	A	A	A				A,B,S,T,X	R,S	✔	✔	✔	✔	✔	✔	✔	✔	F: $500-$900; U: $.05-$.50	V:✔
					H		A	A,B,C,D	A,B,C,D	B,C	B,C	B,C												
BT (800) 872-7654	Global Network Services	520	850	108	T	A,D	A,D	A,D	A,D	A			✔	A,B,S,T,X	C,R,S	✔	✔		✔	✔			✔	F: $850-$1,500	C: $3-$7.50; V:✔
					H				D	B,C,D	B,C,D		✔											
Cable & Wireless Communications, Inc. (703) 790-5300	Managed Data Services	108		80	T	A	A	A	A,C			C		A,S,X	R				✔	✔	✔			(1)	
					H	A	A,C	A,C	A,C	C	C													
CompuServe, Inc. (800) 433-0389	Packet Services	370	9		T	A	A	A	A,C					A,S,X	R,S,T	✔			✔	✔	✔	✔	✔	F: $350-$3,000; U: $.03-$.05	C: $2.80-$5.75; V:✔
					H	A,C	A,C	A,C	A,C	C	C	C												
GE Information Services (800) 433-3683	GE Information Services	535	34		T	A	A	A	A	D	D			A,S,T,X	R,S,T	✔	✔	✔	✔	✔	✔	✔	✔	(1)	
					H	A	A	A	A	A,D	A,D	C												
Graphnet, Inc. (201) 837-5100	GraphPak	(1)		7	T	A,C	A,C	A,C	A,C	C	C	C		A,B,S,T,X	R,S,T	✔	✔				✔	✔	✔	(1)	
					H	A,C	A,C	A,C	A,C																
Harbinger*EDI Services, Inc. (800) 367-4272	Harbinger*EDI	1			T		A	A	A					A,B,S,X	R,T	✔	✔		✔	✔				F: $10-$600; U: $.02	V:✔
					H	A	A	A	A	A	A	C												
Infonet Services Corp. (310) 335-2858	Infonet	255	34	145	T	A	A	A	A,C,D	A,C,D	C,D	C,D	✔	A,S,T,X	R,S,T	✔	✔		✔			✔	✔	F: $415-$1,850; U: $.04-$.22	C: $4.40-$13.40
					H				D	D	D	D	✔											
MCI Communications Corp. (800) 444-6245	MCI Mail	(2)	28	90	T	A	A	A	A					A,B,S,X	R	✔	✔		✔					F: $35; U: $.05	V:✔
					H	A	A	A	A																
Sprint Corp. (800) 736-1130	SprintNet	526	343	117	T	A,D	A,D	A,D	A,C,D	D	C	C	✔	A,B,S,T,X	R,T	✔	✔		✔	✔	✔	✔	✔	F: $615-$1,525; U: $.02-$1.4	C: $1.17-$9; V:✔
					H	A,D	A,D	A,D	A,C,D	D	C	C	✔												
Sterling Software, Inc. (800) 876-9627	Ordernet Services	500	20		T		A	A	A,B	B	B	B,C	✔	A,B,S,X	R,T	✔	✔		✔	✔	✔			F: $250-$1,000/year	V:✔
					H	A,C	A,C	A,C		C															

Access speeds (bit/sec): A = Dial-up; B = Switched digital; C = Dedicated digital; D = Dedicated analog

Pricing: F = Fixed charge per port per month; U = Usage fee per kilo-character; C = Connect-time charge per hour; V = Volume discount

Asynch = Asynchronous
CMIP = Common Management Information Protocol
POP = Point of presence

FOOTNOTES:
(1) Vendors declined to provide pricing information.
(2) Toll-free or 800 access only.

SOURCE: TELECHOICE, INC., MONTCLAIR, N.J.

use that same link to access other services, such as 800, WATS, virtual network service and private lines.

The geographic makeup of a user's organization and how that relates to the VAN's geographic presence can affect which VAN's dedicated access service is selected. Using a VAN with few POPs may result in at least some locations ending up with a relatively long dedicated access link, which can be a reliability issue and result in higher access costs. BT, GE Information Services (GEIS), Sprint and Sterling Software, Inc.'s VAN services have between 500 and 535 POPs each. CompuServe, Inc. has 370, Advantis, 276, and Infonet Services Corp., 255.

Some carriers, including CompuServe, BT and Sprint offer dial-up backup in case the dedicated circuit fails. The backup comes in two flavors: A customer can lease a private dial-up port that will always be available, or the customer can subscribe to a pool of shared-access ports. Leasing a private port is usually more expensive, but the customers can count on it in a crisis.

One of the most cost-efficient access methods is to dial up a local number that provides switched access to the nearest VAN POP. Most VANs offer dial-up access in most metropolitan areas and require users to pick up the cost for the local portion of the call. Some VANs offer an 800 number as a backup.

However, customers are increasingly asking for uniform-number access through 800 or 950 toll-free access. But with 800 and 950 access, the carrier often passes the cost of the call on to the customer.

Where unlimited local calling is available — where the customer's costs do not rise with the number of calls made — local numbers may be the most cost-effective solution. If an application is networked across stationary sites that use terminal equipment with the access number programmed into it, then the number dialed is not much of an issue. On the other hand, for roving sales personnel with constant dial-up needs, a single nationwide 800 or 950 number may be best.

Today, 950 access is available through database access menus, such as those offered by AT&T's InterSpan Information Access Service, or for particular users with customer-specific access numbers. InterSpan is reached via a 950 number and provides a menu of services that can be accessed, including EasyLink Services, AT&T Mail or customer-specific applications.

It takes less time to set up a 950 call than it does an 800 call. And with 800 portability promising to make 800 call setup times longer, 950 access looks even better, especially for time-critical applications such as high-volume credit card validation.

In fact, Visa USA, Inc. uses CompuServe's 950 access to link point-of-sale terminals to its VisaNet credit authorization network.

Access speeds
Access methods are the first step in evaluating whether a particular provider will meet a customer's needs. The next step is availability of the appropriate access speeds.

VANs offer both terminal and host interfaces to their networks. Terminal interfaces are almost always dial-up, wheras host interfaces are usually dedicated. VANs also provide password protection on host interfaces.

Dial-up access speeds for terminals or hosts start at 300 bit/sec, range through the commonly used 2,400 bit/sec, and continue through 14.4K bit/sec, 19.2K bit/sec, 56K bit/sec and higher via Integrated Services Digital Network.

The most common type of dial-up access is 2,400 bit/sec through asynchronous modems. All of the providers offer 2,400 bit/sec access from all of their domestic access points. Most are in the process of upgrading access nodes to 9.6K bit/sec.

For example, Infonet is now upgrading many of its modem

pools to 9.6K bit/sec. CompuServe has committed to ubiquitous 9.6K bit/sec local access by the first half of 1994. AT&T Easy-Link currently offers 9.6K bit/sec access nationwide. BT plans to upgrade all of its domestic dial-in points to 9.6K bit/sec, while Sprint plans to have all of its nodes upgraded to 9.6K bit/sec by the end of the year.

Several VANs have also said they will support 14.4K bit/sec access via V.32bis modems. This speed represents a sixfold increase in throughput for less than six times the cost of the modem. AT&T plans to provide 14.4K bit/sec support by the second quarter, while BT has announced plans to support that speed starting in September.

In addition, BT has said it will support 28.8K bit/sec when it becomes standardized. Other VANs have also pledged to support a developing standard — known now as V.FAST — that will provide 28.8K bit/sec throughput.

Some carriers, including Advantis, AT&T, BT and Sprint, have added switched digital access, as well. Sprint and Advantis support ISDN Basic Rate Interface access to SprintNet, allowing 56K bit/sec access to its services.

Where it's at

While significant, the ability to access a VAN and transport data between user-owned terminals and hosts is just the first piece of the selection puzzle. Today, the ability to access a VAN's host in order to obtain application processing services is where it's at. Typical applications offered by VANs include:

■ **Database access** is the ability to use public and private database hosts. For instance, users can connect to a public database and download financial information.

Or, users could access a private, corporate database maintained by the VAN. CompuServe's CompuServe Information Service and Sprint's Online America are among the strongest offerings in this area.

■ **E-mail** typically includes software and message processing, and, sometimes, provides software front ends for users' personal computers. MCI is the leader in this area with its MCI Mail. AT&T also offers strong E-mail capabilities through its store-and-forward application architecture.

■ **X.400 messaging services** support E-mail and other messaging based on the X.400 standard. These services typically include software and network intercon-

nection, and are important internationally. BT and Sprint are high-end IVANs, where X.400 is used extensively.

■ **EDI** is offered by many VANs and consists of intrabusiness forms processing, software and support. VAN EDI services accept incoming EDI messages and store them for other firms to pick up. VANs often provide a software front end and training services. Harbinger*EDI Services, Inc. is perhaps the most experienced EDI provider and offers Sprint's EDI services, too.

■ **Transaction processing** is a form of database access. A typical application is

credit card validation in which POS terminals pass a credit card number and a purchase amount to a bank or third-party authorization network host for validation. While 10 of the 12 vendors listed in the Buyer's Guide chart on page 36 support transaction processing, Sprint's service is considered very strong. Sprint recently announced a new transaction processing subnetwork, dubbed Tranxact, that offers redundant host access and 950 access.

■ **Managed data networking** typically involves outsourced support for fixed data networks. The provider manages the

transport and the applications for the user. Most providers support this service, but BT and Infonet are among the most experienced.

■ In **X.500 directory services,** the provider supplies a managed directory service that can be used within a single network, such as an E-mail network, or it can be used to provide members of different networks with directory information about one another. Only AT&T and GEIS support X.500.

■ **Router network service,** also a form *(continued on page 40)*

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Source: Simmons CompPro, 1992.

▶ This list includes only highlights of the CompPro results. Find out the details of *Network World's* success by calling your *Network World* sales representative or Thomas J. Wilson at 800-622-1108.

of outsourcing. These services enable users to link local-area networks over VAN provider routers and backbone networks using such protocols as the Transmission Control Protocol/Internet Protocol. While three-fourths of the providers listed in the chart support router networks, Infonet and Sprint have the most experience.

Integration challenges

A VAN's experience with specific applications, such as EDI, has made users aware of the synergies and challenges behind trying to get applications such as E-mail and EDI to work together. Early users found that each EDI transmission generated several E-mail messages.

"There is a significant amount of E-mail activity around an EDI transmission," says Bruce Chambers, EDI program manager for Reynolds Metals Corp. in Richmond, Va. Senders usually post a message that says an EDI transmission has been made. Then the receiver usually sends a message to say that the EDI transmission has been received, he says. Chambers' firm encloses these send and receipt notices in an EDI transaction, thus obviating the need for E-mail.

Integration of applications can come in many flavors. Some carriers will offer integrated network platforms. For instance, AT&T's Unified Messaging Architecture allows E-mail, fax and EDI messages to be left in a single mailbox. AT&T says its mailboxes will also support voice and video. BT's Global Network Services and Sprint's SprintNet offer similar single-mailbox and single-access line architectures.

This kind of integration can be a real boon for users, who are able to use multiple applications from a single logon and through a single access line.

Some vendors, such as GEIS, are developing application integration packages at the software level. The company provides end users with a software front end to its applications — for example, a single PC-based interface to EDI and E-mail.

Another factor to consider is the carrier's experience with applications that are similar to what users need. Through its association with IBM, Advantis has sufficient resources and expertise to implement and maintain IBM Systems Network Architecture networks, for instance. Advantis was formed last year through a merger of IBM's and Sears, Roebuck and Co.'s VAN services.

Getting the information

Many users turn to VANs in part to avoid active network management. However, they often need information about the service — for instance, network and financial data to audit service performance and to determine the costs related to the service. They also need information that helps them charge service usage back to the appropriate departments.

Each VAN provides a program for doing this. Infonet provides customers with a standardized set of reports — available in printed or electronic formats — showing utilization and performance figures. Other providers offer utilization and chargeback information through standardized and custom reporting programs.

However, large firms that want active network management might take a look at BT's Concert network maangement sys-

tem. Concert lets users manage their VAN services via an Open Systems Interconnection Common Management Information Protocol link and custom application program interfaces to BT's internal management systems.

Concert can be operated by BT or customer personnel with their on-site terminals. Concert provides multivendor integrated management, too.

IVANs extend their reach

While customers value domestic VANs for inexpensive transport and enhanced application processing, IVANs are still the only way to send data to many locations around the globe. IVANs are rapidly expanding into more countries, and IVAN pricing continues to be consistently less expensive than dedicated service to most countries.

Another capability that grabs many customers' attention is IVANs' support in regions where customers could not provide their own support. Another key bonus is IVANs' ability to provide turnkey packages that prevent the need for customers to cobble together transport, applications and services from several companies.

"Value-added network services still play a major role in getting our applications from country to country," explains Gerhard Straub, department manager of office automation for Airbus Industrie in Toulouse, France. "We could never re-create our Infonet network ourselves; it would not be worth trying."

The first thing to evaluate about an IVAN is whether it provides the required quality of connectivity to the particular countries that a user must reach.

The highest quality connections are available when the provider owns the nodes in the country. A node typically means a switching device, not merely a concentrator or packet assembler/disassembler. Many carriers, such as Advantis,

BT, Infonet and Sprint, own and maintain nodes in as many as 20 to 50 countries.

Also, the more nodes an IVAN owns in a country, the better. Single nodes sometimes entail X.75 links for transmission to destinations throughout the country.

Almost every IVAN can claim coverage to more than 100 countries via X.75 gateways. However, X.75 should be considered a last resort for connections for two main reasons: limited throughput and reliance on a third party for connectivity in the destination country.

Some IVANs specialize in connections to certain geographic regions. For instance, BT, CompuServe, Infonet, MCI and Sprint provide VAN services in Europe and Japan.

Sprint owns 343 nodes in 40 countries and has multiple nodes in 19 countries. The carrier has made a push in Eastern Europe, with at least one node already in place in Russia and the current installation of an X.25 network in Hungary. BT is also a strong international VAN with 850 foreign nodes, including many in the U.K., Western Europe, Eastern Europe and Japan. Infonet, which is owned by a consortium of 10 carriers from around the globe, owns 34 nodes in foreign countries. CompuServe has the weakest portfolio of international nodes with only nine.

Support and billing

As important as the quality and reach of the VANs' connectivity is the level of service available in each country. One of the main reasons why many users turn to IVANs is the guarantee that service will be installed and maintained correctly. Service personnel who speak the local language and are familiar with local regulations can make a big difference when a customer needs help.

"It is important for us to have in-country facilities and support," says Airbus Industrie's Straub, who is an Infonet user. "If

Users want fixed-rate VAN pricing

While providers of value-added network (VAN) services claim that each user requires its own customized pricing scheme, 45% of respondents to a recent survey indicated they prefer paying a fixed monthly fee for such services.

In the most recent *Network World/ Focus Data, Inc.* survey, 49% of all respondents expect VAN volume discounts for contracts of just one year in length, while 19% and 21% of respondents expect discounts for two- and three-year contracts, respectively.

Top VAN selection criteria	
Based on highest possible score of 10	
Reliability	8.98
Service/support	8.88
Mean time between failure	8.66
Conformance to standards	8.57
Performance	8.45
Ease of use	8.41
Price	7.68
Net management	7.51
Part of a broad line of offerings	6.61

SOURCE: FOCUS DATA, INC., FRAMINGHAM, MASS.

Of those users who participated in the survey, 35% employ services from AT&T, while 22% contract with Sprint Corp. for VAN services. Advantis, BT and MCI Communications Corp. also ranked high on respondents' lists of service providers.

The survey respondents singled out reliability as the topmost criteria that they use in evaluating VAN services, followed closely by service/support issues (see graphic).

On the subject of service/support issues, respondents ranked disaster recovery as the most important for VAN services, followed by maintenance/upgrade programs and remote monitoring.

On average, the largest portion of respondents (15.4%) said they are willing to pay $20 per hour for connect time on a VAN service with an access speed of 9.6K bit/sec.

With regards to fixed-rate service fees, 33% of the users said they are willing to pay between $1,000 and $1,500 per month for dedicated access to a VAN service, by far the largest percentage of respondents. Some 11% of respondents said they would pay a fixed rate of as much as $7,000 per month for dedicated access.

Respondents were divided about the top transmission speed they expect to re-

Users speak on:

AT&T:
"Their pricing is advantageous, especially the long-term packages."

BT:
"Even though they have an ancient engine and old equipment, we have had little hardware failure. The service has been reliable and a good value."

GE:
"GE is competitive on price and willing to customize its offerings to meet our needs."

Sprint:
"Sprint is ubiquitous; it has a global presence."

Based on verbatim responses from survey.
SOURCE: FOCUS DATA, INC. FRAMINGHAM, MASS.

ceive with a monthly fixed-rate service. Interestingly, 51% of respondents indicated they want between 56K bit/sec and T-1 transmission rates, while 14.3% said 19.2K bit/sec speeds are acceptable, and 23% said 9.6K bit/sec speeds would suffice.

The survey is based on responses from 100 *Network World* readers. Of those, 77 have installed VAN or international VAN services, 20 are currently evaluating them, and the remaining respondents have service providers but are also evaluating others.

— *Charles Bruno*

you use private operators to get to a public carrier, all sorts of problems will arise."

An example of the value of IVAN support is evident in international EDI implementations in which the IVAN provides software, transport, mailboxes and training for the customer, as well as implementation support for its trading partners. GEIS provides this type of service for Peu-

geot SA, the French auto manufacturer. Peugeot was able, through GEIS' EDI*Express and custom support, to implement an EDI program that helped shorten its supply cycles from monthly updates to multiple updates daily.

Other IVAN customers agree that strong VAN support services can make a large difference when they are away from home.

"Our network extends to independent agents who have little [networking] expertise," says Ken Palmieri, senior data communications analyst for Airborne Freight Corp. of Seattle. "Our arrangement with Infonet really helps at the fringes of the network."

Customers are holding their providers to their commitments regarding implementation, response times and availability through increasing use of service-level agreements, in which the VAN or IVAN offers the customer compensation if it does not meet the terms spelled out in the initial contract.

Once used almost solely in Europe, service-level agreements are becoming more prevalent and are smoothing the path for a shift in responsibility from internal departments to carrier-managed network services.

BT and Infonet are among the providers now offering service-level agreements that include technical support and outage resolution.

"The network is vital to our business," says David Clifford, computer services manager for London-based Thorn-EMI, a BT customer whose network consists of more than 750 net connections. "Therefore, it is critically important for BT to deliver the highest performance levels. Our managed network from BT can do this, and our service-level agreement with BT guarantees it."

Another feature many users want is for the VAN providers to offer one-stop shopping capabilities. For large international applications, there is rarely a clear-cut public or private network decision, but rather is usually a mixture of the two. For instance, it may prove economical for a

or Outdated?

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Letters

computer programs have a First Amendment right to speak about their creations as well as publish them.

It seems to me that the intent to cause harm — where harm has taken place — must be proven against writers of virus programs before the law can be fashioned to restrain or punish someone from freely expressing their craft.

Craig Allen
Telecommunications specialist
Federal government
Washington, D.C.

Feeling left out

I read with interest the story "Users demanding help in managing big E-mail nets" (*NW*, Feb. 8). I was surprised, however, that

Baranof Software, Inc.'s Mail-Check electronic mail monitoring system was not mentioned in your story.

MailCheck is a multivendor product that provides automated end-to-end mail connectivity checking and helps a network administrator discover problems before they affect users or mission-critical applications.

The system is competitively priced and may be used with many popular local-area network E-mail packages, such as Lotus Development Corp.'s cc:Mail, Microsoft Corp.'s Microsoft Mail, Novell, Inc.'s Message Handling Service (MHS)-based products and the Simple Mail Transfer Protocol.

Ben Littauer
President
Baranof Software, Inc.
Brighton, Mass.

An Internet connection setup

links, uninterruptible power supplies and often provide service guarantees. Beyond this, expect some services to be unavailable at times.

■ **Privacy.** Mail sent over the Internet is usually ordinary, unencrypted ASCII. The chance of any given message being seen by someone who shouldn't is small. But given many users, many months of use, and an occasional disgruntled employee or malevolent outsider, there's a threat.

There are no solutions to this except to encrypt files yourself. Work is ongoing to define Privacy

Enhanced Mail for TCP/IP, and things will improve in the future. But for now, privacy is an issue.

■ **Unauthorized access.** The Internet lets you connect to a wide variety of computers outside your firm. Likewise, others can get into your machines. And as we all know, the Internet abounds with ingenious hackers. The Computer Emergency Response Team investigates and tries to fix security problems, as well as provides advice. It can be contacted by Internet mail at cert@cert.sei.cmu.edu. ⏏

Ferris is president of Ferris Networks, a consultancy in San Francisco. His columns appear the third week of every month.

NetWare to get Alpha-betized

While the DEC deal broadens NetWare's RISC range, the network operating system may not be able to take full advantage of the Alpha architecture. Alpha is a 64-bit chip, while NetWare is a 32-bit operating environment. Although Novell touts Alpha as giving users "headroom" to

grow, the firm has no plans to add 64-bit capabilities to NetWare.

NetWare is also not designed to support the symmetric multiprocessing or clustering capabilities DEC customers can get with Alpha-based machines, and Novell currently has no plans to offer those capabilities.

Finally, the companies are unlikely to scale NetWare along all DEC's Alpha machines, which range from low-end workstations

to very high end mainframe-equivalent computers that DEC refers to as data center servers.

"We haven't determined what will be the highest end machine NetWare will run on," said Robert Supnik, vice president, technical director of engineering and senior corporate consulting engineer at DEC.

Senior Editor Jim Duffy contributed to this story.

HyperDesk beats rivals to punch

Specifically, Version 1.1 supports CORBA's static and dynamic application program interfaces and its Basic Object Adapter standard for integrating back-end services, such as electronic mail and imaging, into object request brokers. ORBs manage message exchange between objects in a distributed environment.

HD-DOMS 1.1 also supports HP's HP/UX and IBM's AIX. HD-DOMS already runs on Sun SunOS, Data General Corp. DG-UX and Microsoft Corp. Windows.

The first fruits of the alliance between HyperDesk and DAC were displayed last week at Uni-Forum 1993 here. The two companies previewed a product called ORB*View, which manages and controls HD-DOMS ORBs from a Unix workstation running the Motif graphical user interface.

ORB*View is a modified version of DAC's OS/EYE*NODE object-oriented management system that enables users to manage and control net-based devices

and applications via the Simple Network Management Protocol or the Common Management Information Protocol (CMIP) standards. OS/EYE*NODE provides an event-driven graphical representation of network devices and systems, and supports gateways that can forward SNMP traps to IBM's NetView.

ORB*View collects information about HD-DOMS ORBs via object interfaces to SNMP or CMIP agents within the ORBs. The agents provide performance, configuration, account and security information about the ORB, as defined by a Management Information Base (MIB) developed by HyperDesk and DAC. The ORB MIB will be submitted to the Internet Advisory Board for approval as a standard.

HyperDesk will market ORB*View as an optional add-on to HD-DOMS in the third quarter. ORB*View will run on workstations from Sun, HP and DG.

DAC, on the other hand, will sell extensions to ORB*View that

will enable users to manage both HD-DOMS and their network from a single, integrated graphical display. Few products on the market today offer integrated management of hardware, software and network components in a heterogeneous environment.

ORB*View and its extensions will be powerful new tools for NetWare users, analysts said.

Next year, HyperDesk and DAC plan to extend ORB*View to manage individual CORBA objects, not just HD-DOMS ORBs. While ORBs can provide system-level information, objects can provide detailed information about the performance of individual applications or components within applications.

The companies plan to develop new object classes within HD-DOMS that enable users to build objects that inherit management characteristics. For example, an object that encapsulates an on-line transaction processing application could inherit characteristics that enable ORB*View to collect information about how many times a certain transaction has been executed. ⏏

Not just X.25 anymore

large company with operations in both North America and Europe to carry its packet data over an international private line between the two continents with VAN service at both ends.

Many carriers, such as BT and Sprint, have the ability to mix and match services, dedicated circuits and equipment where necessary. Infonet can provide similar installation and maintenance support.

Another area of concern is the sometimes complex process of billing international services. IVANs provide customers with various billing options, including billing in native currency and language, consolidated bills in a single currency or any mixture of the two.

Infonet offers flexible billing plans, including location-level, subaccount-level and single Global Bill options. Other carriers, such as BT and Sprint, provide

similar options.

Paying the toll

The bottom line in evaluating a service is its bottom-line cost.

When it comes to paying for VAN and IVAN services, there are telling differences in how customers are billed by the various providers. These schemes range from simple fixed charges to a complex blend of usage-based charges — by the kilocharacter transmitted or the hour connected, or via fixed, monthly per-port charges.

"We have tried to standardize and simplify pricing, but every interesting opportunity seems to call for its own unique scheme," says Ron Bamberg, vice president of business development at BT North America, Inc., a division of BT.

Providers such as Infonet stick to fixed network charges, with a specific amount due for the network over a certain period, regardless of the traffic amount. CompuServe offers Fixed-Dial, giving the user a single dial-up ac-

cess port for a fixed monthly fee.

Fixed charges are also available for dedicated ports. Charges for switched ports usually involve connect-time charges and usage charges based on kilocharacters transmitted.

> There are telling differences in how customers are billed for VAN and IVAN services.
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> ▲▲▲

Usage charges often entail additional connect-time charges and are not favored by most users. Most providers — for example, CompuServe and Sprint — are phasing them out and opting instead for either straight connect-time charges for dial-up connections or simple fixed monthly charges.

AT&T's InterSpan Information Access Service offers a straight per-minute connect-time charge that is independent of access speed.

Pricing out VAN or IVAN services is also difficult because providers often use different means to provide the applications requested by users. Many times, the only way to get firm prices is to tell the provider what you want to do and listen to their suggestions.

Up and coming

Both domestically and internationally, VANs are providing outsourcing and assuming broad network management responsibilities for customers. More and more, users are finding ways to employ some or all of a VAN's services to achieve broad geographic coverage in a cost-efficient manner.

One of the most exciting new developments in the VAN arena has been the emergence of wireless access through cellular and packet radio technologies such as those offered through RAM Mo-

bile Data, Inc. and other providers.

AT&T, BT and Sprint are testing RAM Mobile Data's packet radio system. Only a few customers are using this type of access at the moment, but it is sure to become increasingly important to mobile applications.

Also, traditional asynchronous dial-up modem access to VANs via land-line connections has been going through steady upgrades in speed over the past few years. For end users, the analog technologies continue to be surprisingly resilient in light of new digital counterparts. Given the universal availability of X.25 and other VAN services, one can expect this trend to continue. ⏏

Briere is president and Finn is an associate with Tele-Choice, Inc., a Montclair, N.J. consultancy specializing in strategic planning and analysis of intelligent networks, services and applications. They can be reached at (201) 746-0200.

Top rivals unite to thwart NT

tion. Finally, they agreed to work together on graphics, multimedia and object technology.

Each group member has agreed to sell and support three common networking technologies: the Open Software Foundation, Inc.'s (OSF) Distributed Computing Environment, the Sun Open Network Computing+ environment, and the Novell, Inc.-Univel NetWare Unix client.

In addition, each company will put all three technologies on their price lists, but individual companies will announce pricing and availability separately.

That means the same networking technology will be available from numerous vendors, which should foster more application interoperability and make it easier to design and implement heterogeneous Unix networks.

With these technologies available across multiple platforms, users will be able to take advantage of the computing resources of the entire network, said Scott McGregor, vice president of products at SCO.

But will this attempt at unification be enough to stave off the competition?

Stan Schatt, a senior industry analyst for Infocorp, said the consortium could create a "a formidable foe for NT" when coupled with the Windows support and price cuts announced for UnixWare last week (see "UnixWare prices chopped; Windows support added," page 13).

The vendors better get it right with Unix this time, he said, because this is "probably the only window of opportunity."

Cooperation on this scale inevitably involves compromise,

> T he vendors better get it right with Unix this time, Infocorp's Schatt said, because this is "probably the only window of opportunity."
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and managing perceptions of winning and losing may be the new group's most challenging task. "There were a lot of things we had to work out," said Joe Menard, USL's vice president of marketing. "Everyone had to give up this to get that."

Bob Gill, a vice president at Gartner Group, Inc. in Stamford, Conn., asked, "Is everybody going to profit [from] this? Probably not." But ending the "senseless, pointless [battles over] personal glory and pigheadedness" is clearly in the best interest of the Unix user and the Unix industry, he added.

While more than two dozen Unix players have already expressed their support for the new group — with many more expected to sign on — there were also some notable absentees. Digital Equipment Corp., which has committed to running Windows NT on its new Alpha platform, was the most prominent no-show.

The plans so far

Those that were on hand outlined only a few specific actions.

In order to leave the standardization process as open as possible, the deliberately unnamed group plans to rely on the X/Open Company, Ltd.'s X/Open to certify and brand any new specifications, which would allow other companies to contribute to the process. Vendors would be free to market their own implementations of the standards.

The OSF agreed to submit its Motif graphic user interface to X/Open, and Novell and Univel

agreed to submit their NetWare Unix client to X/Open, making it available to the entire industry.

The companies plan to say more about who is doing what within 30 days and publish a preliminary specification for the common desktop environment by the end of June. In October, they will host a developer's conference to reveal prices and additional information.

HP, IBM, Sun and USL plan to ship an implementation of the common desktop in the first half of 1994 and license it openly to the industry.

Rather than rely on completely new technology, the new desktop will create a common "dashboard" for Unix by incorporating various parts of existing technologies from numerous vendors. This will help maintain compatibility with existing applications.

The group will choose pieces of the new desktop from HP's Visual User Environment, IBM's Common User Access model and Workplace Shell, OSF's Motif tool kit and Window Manager, Sun's Open Look and DeskSet productivity tools, and USL's Unix SVR4.2 desktop components and scalable systems technologies.

The common desktop will support electronic mail; group calendaring; text editing; audio; task and window management; on-line help; drag and drop application integration with linking, embedding and data interchange; dialog and forms building with icon editing; graphical object/file management; advanced security features; and installation automation and run-time configuration.

Point of concern

The weakest part of the announcement concerned systems management support. The only concrete step announced was the creation of a working group to study common specifications for user and group management; software installation, distribution and licensing; storage management; and distributed file management.

The problem, according to David Tory, president of the OSF, is that no vendor wants to give up its existing management system. The six companies promised a road map with more detail in the third quarter, which gives them time to work out some of the political issues.

Noting that the decision involved business issues as well as technology issues, Menard predicted that the new group would use the common desktop as a model for its management system, taking a bit from here and a bit from there, rather than selecting a technology from just one company. ⚡

IBM piques user interest in CPI-C

Technologies, Inc., Apple Computer Corp. and Boeing Computer Services — to speed CPI-C's growth and better define requirements for future enhancements.

One of the features the CIW will add to CPI-C 2.0, due out by year end, is support for multivendor distributed directories. The CIW wants CPI-C applications to support any directory service the user wants, such as X.500 or the directory used by the Open Software Foundation, Inc.'s Distributed Computing Environment.

Distributed directory support will give developers more choices in how they enable one CPI-C application to locate another. Currently, proprietary "side directories" are required to store locations of CPI-C applications.

"The goal is to let CPI-C applications take advantage of all the emerging distributed directory services and not be limited to just one," said Jack Sanders, a senior engineer in IBM's distributed systems architecture group.

The CIW also will add improved CPI-C support for the Open Systems Interconnection Transaction Processing standard (OSI/TP). CPI-C Level 1.2 contains basic support for OSI/TP, but not the bells and whistles, Sanders said. For example, CPI-C 2.0 will be able to determine the status of another CPI-C application before its transmits data so that data is not sent to a node that is off-line or out of service.

In addition, the CIW proposed the addition of a query feature that will let CPI-C 2.0 applications query other CPI-C applications to determine their level of CPI-C support.

This feature is important because CPI-C 2.0, unlike previous versions, will support full-duplex communications. The feature will let a CPI-C 2.0 application recognize a CPI-C 1.2 application and communicate via the half-duplex sessions that CPI-C 1.2 uses.

Other enhancements the CIW is working on include better security features and improved support for full-duplex communications, Sanders said.

Analysts said the enhancements will help IBM establish CPI-C as an industry standard for communications interfaces.

"IBM has CPI-C development down as a hot priority because the company wants CPI-C viewed as an open and complete standard as soon as possible," said Dick Boyle, program director for local-area communications at Gartner Group, Inc., a consultancy in Stamford, Conn. "The CIW is a great approach to getting things done, and these enhancements will help." ⚡

APPI has run its course

IBM has announced its intentions to make APPN an open and more technically elegant method for SNA peer-to-peer networking.

What remains is an exercise in redundancy that is likely to do SNA users more harm than good.

According to David Passmore, a vice president at Gartner Group, Inc. in Stamford, Conn., the initial groundswell of APPI enthusiasm has abated and the protocol now has little chance of becoming a major industry standard.

"The question is, will [the market for APPI] be big? Increasingly, the answer is no, simply because of the way IBM has responded," he said.

APPI was created as a way to let APPN devices be supported over TCP/IP-based backbones without relying on APPN Network Nodes (NN) to supply routing instructions, as is the case in APPN nets.

To accomplish that, Cisco plans to turn its routers into what it calls Open Network Nodes (ONN). ONNs will support APPN End Nodes and Low Entry Net-working Nodes and communicate with them via LU 6.2 sessions, just as in an APPN net. But ONNs will attach an IP header to the LU 6.2-based traffic and route it across the backbone using TCP/IP.

According to Michael Zadikian, Cisco's SNA product manager, this strategy addresses some of APPN's key technical shortcomings, particularly APPN's inability to dynamically reroute sessions due to failed links or to employ new routes as links become congested or other routes become available.

Another key APPN drawback lies in its performance. APPN lacks connectionless transport services and requires each intermediate node to be involved in protocol processing and routing decisions, which limits throughput.

APPI is also being touted as a way to enable users of large internets to deploy TCP/IP as their sole backbone protocol, eliminating the need to add yet another protocol suite to their nets.

And, unlike APPN, Zadikian said APPI is also available free of charge.

IBM has not taken this fusillade of criticism lying down. The vendor has announced APPN extensions that resolve the technical deficiencies leveled against APPN by the APPI Forum.

APPN+, now known as High Performance Routing, will be available next year and consists of two new features that will support the dynamic routing of data around net failures and provide as much as a tenfold performance boost (see graphic, page 55, and

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> "The question is, will [the market for APPI] be big? Increasingly, the answer is no."
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"New features to shore up IBM's APPN," NW, Dec. 21, 1992).

Technical uncertainty

Meanwhile, APPI has had its share of technical problems. It has yet to be explained how APPI and APPN will exist in the same router or how the two would interoperate in the same network. Likewise, there are no details available on how traditional SNA

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directory services will be integrated into the ONN directory services.

Zadikian said those issues will be addressed in the second phase of APPI's evolution, but the current technical uncertainty has left even APPI supporters wary. Proteon, Inc. — the only major router vendor besides Cisco to endorse APPI — said it has become disenchanted with APPI's long-term prospects.

"While the goal of APPI is to enable IBM migration, in its current state it actually pushes IBM out to the periphery of the network and doesn't let users take advantage of IBM's evolution," said Dick Lush, Proteon's director of internetworking product marketing.

"It's drifting away from openness to a kludge solution — and that typically ends up being a proprietary solution," he said.

In addition to addressing APPN deficiencies, perhaps the most significant reason for the birth of the APPI Forum was to promote an open alternative to the proprietary APPN. APPI is deemed as a way to keep IBM — with whom the ultimate control of APPN source code rests — from obtaining an unfair competitive advantage over other vendors.

Just as with the technical issues, IBM has quelled the maelstrom of controversy surrounding APPN's cost and proprietary nature in a number of ways.

Earlier this year, IBM made its NN specifications available for less than $1,000, thereby enabling vendors to build their own APPN NN from scratch without paying IBM's $400,000 licensing fee.

IBM is also submitting its Data Link Switching (DLS) and APPN-over-TCP/IP Sockets specifications to the Internet Engineering Task Force this month for consideration as standards. DLS is IBM's method for supporting the transmission of traditional SNA data across TCP/IP nets, while the latter gives APPN support for applications written to TCP/IP's Sockets interface.

Finally, IBM recently began offering an intellectual property package to third-party APPN developers for about $10,000. It includes copyrights, patents and trademarks, enabling developers to build APPN products and license them to other vendors. That means IBM will no longer be the sole source of working APPN code.

Despite these strides toward

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openness, some are still not convinced that a level playing field now exists.

"I'm concerned about the proprietary nature of APPN, despite IBM's [new] licensing agreements. I'm also concerned about IBM putting APPN code into their own products before releasing them to other vendors," said Nancy Vandell, information architect at Chevron Information Technology in San Ramon, Calif., a large Cisco user. "We encourage IBM to become truly open by working in a forum with other vendors on standards associated with APPN."

IBM said it intends to do just that. The vendor announced last week the formation of an APPN Implementors Workshop (AIW) that is open free of charge to any vendor or user interested in having a say in the development of APPN.

Steve Joyce, IBM's manager of Advanced Program-to-Program Communications market enablement, said IBM is dissolving its in-house Architecture Maintenance Board in favor of the new group.

"All vendors can bring their requirements and propose solutions to the working group. Since they will be fully involved in APPN as it's being developed and enhanced, there is no way they will be put at a competitive disadvantage," Joyce said.

But Cisco's Zadikian is not convinced.

"IBM has come a long way, but it's our belief that APPN is still not really open and IBM will still control its evolution," he said.

However, most other router vendors say they are staying squarely in the Blue camp. Cross-Comm Corp. and 3Com Corp. have already licensed APPN, while Advanced Computer Communications, Network Systems

APPI vs. APPN: A technical comparison

Feature	APPN	APPI
Class of Service	Yes	Future
Alternate routing and flow control	Available in 1994 with HPR's Rapid Transport Protocol	Yes
Connectionless end-to-end routing	Available in 1994 with HPR's Automatic Network Routing	Yes
Transport mode	SNA transported in native mode	SNA encapsulated in TCP/IP
Scalability (effective addressing for large nets)	Yes	Future
Management	Managed via NetView	Requires consolidation of NetView- and SNMP-based management platforms
Transition effort	Higher due to APPN learning curve	Lower for TCP/IP users
Cost	More expensive due to IBM and third-party developers licensing fees	Included with router software at no additional cost

HPR = High Performance Routing (formerly APPN+)

SOURCE: NETWORK WORLD AND GARTNER GROUP, INC., STAMFORD, CONN.

Corp., Retix, Inc. and Wellfleet Communications, Inc. have all committed to adopt the technology.

Representatives from each company said they have seen little interest in APPI from their customers as a long-term SNA strategy.

Even Cisco said it intends to license APPN NN by midyear as a complement to APPI.

Tony Spielman, director of internetworking product marketing at Network Systems, echoed other vendors' sentiments when he said his company's refusal to embrace APPI was made purely on technical and interoperability grounds.

"If the goal is interoperability, why would we promote a protocol that may not be interoperable with APPN? The object is integration, not conversion," he said. "But I applaud Cisco because APPI has forced IBM to be more open with respect to APPN."

Many industry observers — including some of Cisco's staunchest rivals — agree that the APPI Forum has prodded IBM into making greater strides toward openness. Even IBM's Joyce acknowledged that the existence of APPI did nudge IBM in a more open direction.

For that alone, Cisco's efforts deserve considerable applause.

But most of the other issues that led to the development of APPI in the first place have now been addressed. Technical enhancements are on the way that address APPN's current shortcomings, and IBM has taken steps to address the cost and openness fronts.

The argument that APPN will keep IBM "one step ahead" of the pack is now largely a paper tiger. Clearly IBM has made concessions, and third-party APPN developers that vendors can turn to instead of IBM will begin popping up.

Cisco's Zadikian said his company remains committed to the APPI Forum's goals — despite IBM's recent moves — because the TCP/IP-centric architecture will be attractive to users with large TCP/IP-based internets.

The APPI Forum should recognize that this issue represents a mere shell of the group's original purpose and fold its efforts into the new IBM AIW. In that way, the group's members could use their clout to ensure that future APPN developments are beneficial to all APPN vendors involved.

Users should also get involved in the AIW and make it known to their respective vendors that the last thing they need — or want — is the complexity or interoperability headaches inherent in two competing routing schemes.

"There seems to be a lot of effort going into developing two different protocols that will do almost the same thing, and I just don't see why that's necessary," said John Scoggin, network supervisor at Delmarva Power & Light Co. in Wilmington, Del. "It's a political fight where the biggest losers will be the users." ☒